RAW MATERIALS

1 *Cleome viscosa oil*

Cleome viscosa (capparidaceae) a weed growing all over the barren lands of India, is also known as wild mustard since its seeds resemble mustard seeds. The whole plant is edible and the seeds have 26% oil. The oil is rich in linoleic acid (70%) and has no abnormal chemical constituents. Nutritional and toxicological studies by multigeneration feeding in rats revealed that this oil can be safely used for edible purposes.

PFNDAI Newsletter. No: 3, 1985, 8

STORAGE AND INFESTATION CONTROL

2 Chocolate and fat storage tanks

The tank has a mild steel shell, externally painted with one coat of heat resistant aluminium paint for subsequent insulation. Shot blasting and coating can be carried out to special order.

The interior is coated with liquid paraffin (edible grade) for transit; the tank should be flushed before first filling. Fat content of the product provides protection afterwards.

The tank is fitted with a symmetrical vertical axis stirrer (chocolate liquor tanks only) top suspended and with a bottom retaining bearing. Angled blades provide vertical movement and effective stirring at a nominal 10rpm provided by a motor and reduction gearbox. Top inlet and bottom outlet are standard; additional connections are to customer requirements.

Standard fittings are contents level guage, temperature guage, sample point. The standard lid lifts off entirely; a hinged lid is optional.

The base of the tank may be flat or conical (sloping bases are also available for fat storage only). Flat based tanks are mounted on a rectangular hollow steel frame on four fixed feet; conical based on three or four fixed legs, the standard height of leg to base of tank is 1m.

The tank can be heated (up to 60 C) by two methods: 1 Water jacket, bottom and sides, with external connectors (M24 or 1in BSP) or auxiliary tank with immersion heater and circulation pump. 2.Electrical heating tape on lower portion of tank.

This is about vertical tanks only. Horizontal tanks for chocolate or fats are also manufactured by Bradley Forge. and Engineering Co. Ltd, 75 River Rd, Barking Essex, IG11, ODR

3 Electronic insect killer

Ventura manufacture electronic insect killer, a technological advantage over hazardous toxic chemicals. It is totally free from nasty odours and chemicals to exterminate the germs carrying insects like flies, mosquitos, gnats, moths etc. The unit consists of a 'blue-light' which attracts the insects; the 'electrified grid' which electrocutes the insects and the 'collection tray' where the insects fall. Three models are offered with various cover range; Model 100 with a range of 46.5 m^2, Model 150 with a range of 93.0 m^2, and Model 200 with a range of 111.6 m^2. The unit can be used in hotels, food processing industries, kitchens, canteens, etc. For further information write to: Ventura, K.D. Chambers, On 6th Road Junction, Navrangpura, Ahmedabad, Gujarat 380 009
Industrial Products Finder 13(Annual), 1984, 349

4 Radiation process enables Ecuador to export fruit

Dr. Joseph Orr, a physical chemist and specialist in radiation and radioactivity at Dundee University, has perfected a technique for irradiating the soft fruit grown in Ecuador, sterilizing it sufficiently that it may now be exported to Europe.

The climatic conditions in Ecuador ensure a year-round supply of soft fruits, but in the past the shipping distance made it impossible to export the fruit to European markets. The sterilizing of the packaged fruit will be accomplished by bombarding with gamma rays one thousand times higher than lethal human dosages to kill off the ripening organisms without leaving a residue or changing the flavor of the fruit.

The United Nations is bringing the project on line with the installation of a linear accelerator, and top quality soft fruit from Ecuador will soon be available for the first time in Europe.
Food Technology 38(10), 1984, 91

5 Fumigant monitor

The Fumigameter 40 manufactured by Herrmann Meritz of France, is a complete self-contained unit which is used to measure the concentration of the fumigants used in farming and in the agri-foodstuffs industry. It indicates the residual concentration of gas after fumigation. Thus from a known initial dose, the quantity of fumigant taken up by the foodstuff can be determined. In this way controlled addition of extra fumigants may be used, ensuring effective disinfection of the foodstuffs. The detector consists of a metal block housing two thermistors heated to the same temperature. One of them is sealed inside a small chamber with pure air and the other supplied with a light current of air to be analysed. If this air contains a certain quantity of gas, the measuring thermistor changes temperature by an amount proportional to the quantity of the fumigant, emitting an electrical signal which deflects the pointer of a galvanometer. The unit can be easily transported in a practical carrying case. For further information write to: Technovation-Artech, 3A Mahakali Caves Road, Andheri (East), Bombay 400 093
Industrial Products Finder 13(Annual), 1984, 385

6 Grain fumigation using CO_2

Grain fumigation by using carbon dioxide is increasing. The Environmental Protection Agency recently approved the request of Dallas-based AmeriGas, Inc., to sell and apply carbon dioxide for fumigation of stored grain. The gas, used successfully for decades in Australia, Israel, Italy, and Japan, is a "safer, natural, and economical alternative to the leading fumigants, such as ethylene dibromide (EDB), methyl bromide, carbon tetrachloride, and phostoxin," according to W.P. Heckel, Vice-president of AmeriGas. As a fumigant, carbon dioxide is introduced into the storage building and kept there for 36 hours to four days, depending on the insect kill required. It apparently increases the rate of respiration of the insects, which causes them to die from dehydration. The lack of any residue on the grain and food products made from it is also a plus. Carbon dioxide has already been approved by the FDA for use in controlling insects in stored agricultural products.

Cereals Foods world 29(12), 1984, 789

FOOD ADDITIVES

7 Calcium-rich foods combat salt

The latest news on salt in the New Zealand diet, according to research at Otago University, is that it could be causing a calcium deficiency and, therefore, people have been advised to keep up their intake of calcium-rich foods such as milk, cheese, yoghurt and tinned fish.

The research has shown increasing salt in the diets of animals and people leads to an increased loss of calcium from the body.

Dr Ailsa Goulding a senior research officer at Otago University School of Medicine, said that unless the calcium was replaced through the diet by eating foods like milk and cheese it was taken from the bones.

"The long term result of losing calcium from the bones without its being replaced is loss of bone structure."

As well as keeping up their intake of calcium-rich foods Dr Goulding advised people to exercise regularly and sit out in the sun.

She said the research indicated it would be a good idea to cut back on salt.

Food Technology in New Zealand 19(8), 1984, 5

8 Lac as food colour viable

Scientists have found that lac dye, a waste product of shellac, can be used as a viable food colouring agent.

Dr Indira Chakravarty and her associates at the All India Institute of Hygiene and Public Health (AIIHPH) conducted a series of experiments with lac dye to find its use as a food colouring agent.

They found that the lac dye seemed to have no toxic effects on the biochemistry of the liver and the brain. Laboratory experiments showed that it had no tumour promoting activity.

According to the findings the lac dye is free of any hepatotoxic effect and does not affect the brain tissues even when fed to animals at a very high dose.

The experiments were conducted on the basis of World Health Organisation's classification and the doses were selected as per rule of the Government of India.

The Times 11 February 1985, 2

9 The flavour of butter

The taste element of butter comes from the flavour enzymes which are contained in it and which constitute only 0.5 per cent of the total volume of butter.

A new product called Flavour Plus from Butter Buds is described as concentrated natural butter flavour granules. It presents the natural flavour of butter and, used as an ingredient instead of butter or margarine, offers considerable cost savings to manufacturers , while allowing them to ehnance the flavour of their products.

Flavour Plus is a stable product with a long life without the need for refrigeration. It is supplied in three different concentrations 8, 32 and 75 times the flavour equivalent of natural butter. It has good mixing qualities, is readily soluble in warm water and will not adhere to equipment.

Additional information on Flavour Plus natural butter flavour granules is available from Cumberland Foods, a Division of Dietary Foods Ltd at Cumberland House, Brook Street, Soham, Cambs CB7 5BA.

Food Trade Review 54(4), 1984, 195

"Neosugar", A new nonnutritive sweetener

The search for new nonnutritive sweeteners that are completely safe continues. One that has recently come under scrutiny is "Neosugar". Neosugar is a mixture of 1^F-(1 fructofuranosyl)$_n$-1 sucrose (n = 2 to 4, n = 2, 1-kestose (GF_2); n = 3, nystose (GF_3); n = 4, 1 - 1^F - fructofuranysl nystose (GF_4))

Fructooligosaccharides can be found in many plants such as onion, asparagus root, tubers of the Jerusalem artichoke and wheat or triticale. To date, Neosugar has never been used as a sweetener. Neosugar can be manufactured from sucrose by using a fungal fructosyltransferase. The sweetness of Neosugar is about 0.4 to 0.6-fold that of sucrose and has a pleasant taste. It behaves like sucrose under most food processing conditions.

The digestibility of Neosugar was investigated *in vitro* and *in vivo* by the hydrolyzing enzymes of the gastrointestinal tract and some organs of the rat. The results obtained found that GF_2 and GF_3 were not hydrolyzed by a pancreatic homogenate. The GF_2- and GF_3-hydrolyzing activities of the enzymes of the intestinal mucosa homogenate were negligible compared with the activities of sucrase and maltase. GF_2 and GF_3 added to the incubation mixture did not affect the activities of sucrase and maltase in the intestinal mucosa. Long term ingestion of Neosugar did not cause induction or suppression of GF_2 - and GF_3 hydrolyzing enzymes in the small intestine.

(U-^{14}C) Neosugar injected intravenously was rapidly excreted in the urine without having undergone any degradation. These results indicate that Neosugar, which consists of GF_2, GF_3, and GF_4, is scarcely hydrolyzed by the digestive enzymes of the gastrointestinal tract and internal organs of the rat thus it appears that Neosugar is not utilized as an energy source in the body.

This study has shown the potential of Neosugar as a new nonnutritive sweetener. It is apparent that additional research into the metabolism of this compound in humans is needed.

FNP Newsletter 8(7), 1984, 1-2

11 Polydextrose

Polydextrose is a water-soluble, reduced-calorie (one-calorie-per gram) polymer of dextrose with small amounts of sorbitol and citric acid. Produced by Pfizer, Inc., Chemical Division, Groton, Connecticut, this food ingredient functions as a bulking agent, texturizing agent, and/or humectant in a wide variety of foods. Polydextrose has been cleared by FDA for use in baked goods and baking mixes; chewing gum; confections and frostings; salad dressings; frozen dairy desserts and mixes; gelatins and puddings; and hard and soft candies.

To-date, polydextrose has been used as a partial replacement for sucrose and/or fats in the above products to produce low-calorie and reduced-calorie foods. New and potential applications development work by Pfizer and food processors are centering on the applications of the ingredient in baked products and frozen dairy desserts. Other applications projects involve use of polydextrose in combination with aspartame to produce sugar-free products.

Food Technology 38(11), 1984, 94

12 An alternative to chocolate

Chocolate, like most ingredients used in bakery and pastry-cook manufacture, has been subject to cost increases over recent years.

However, the public demand for chocolate-coated pastry goods at a

reasonable price is such that alternative ingredients have been found. The Nestle Company has developed Bakers Dark Coveture and the product has achieved wide acceptance in the trade due to its excellent taste and appearance.

In fact the coveture sets to a high gloss finish that remains for days after application. Shelf life and storage qualities have proven satisfactory with no adverse affects on finished goods when correctly refrigerated.

Nestle Bakers Dark Coveture is suitable for enrobing. It can also be used for hand dipped ice-cream, piping, soft-spreads, and chocolate chips. It is available in 5kg slabs.

For free recipes and further technical information contact Nestle Foodservice. - The Nestle Company (NZ) Ltd, Box 1784, Auckland.
Food Technology in New Zealand 19(6), 1984, 49

PROCESSES

13 Scottish enzyme speeds production

A new advance in biotechnology is said to speed production of corn syrup and, compared to current North American production methods, could save the industry millions of dollars.

The new enzyme, called immobilized AG, cuts syrup production from two days to under 10 minutes. The enzyme then can be recycled instead of replaced as in present technology.

A similar enzyme development will soon be released for the cheese industry, says the company.

British Charcoal and Macdonalds, c/o Carl Byoir & Associates, Inc. 380 Madison Ave. New York, N.Y. 10017. USA
Food in Canada 44(6),1984, 35

14 Glucose isomerase for high fructose syrup

Glucose isomerase may be used in the production of high fructose corn syrups. Glucose isomerase GA is an immobilized glucose isomerase derived from *Streptomyces griseofuscus*. It is immobilized on an aminosaccharide carrier by cross linking with glutaraldehyde. More information is available from Amano International Enzyme Co., Inc., P.O. Box 1000. Troy, VA 22974

Food Technology 38(10), 1984, 129

15 Higher oil recovery from oilseeds

Higher recovery from oilseeds and better energy efficiency are possible with a wet-grinding process being developed by EPE Inc., Strongsville, Ohio. In a demonstration, the process left only about 5 per cent residual oil in copra, compared to an average of about 8-18 per cent for conventional routes. Typically, oilseeds or other oil bearing biomass are broken into 0.25 inch pieces in a hammermill, then are treated in flaking rolls and a dryer to reduce moisture from about 6 per cent to 2 per cent. The final step is filter pressing to recover oil. An alternative is to prepress the seeds to remove about half the oil, mill and solvent-extract the remaining oil. The process starts with a hammer-mill, then substitutes wet grinding, using the seed's oil and finally drying and centrifuging to separate the solids from the slurry. At this point about 35 per cent of the oil is still in the solids. Filter pressing recovers all but 5 per cent. The process was piloted last year in a 100-metric ton/d plant being run at 1 m.t./h (about 25 per cent capacity) in the Philippines using copra.

The Chemical & Polymer Times 13(11), 1984, 1

16 Method for raisin making

A new method for raisin making that can easily be adopted by farmers with minimum input has been developed by the Indian Institute of Horticultural Research, Bangalore.

For making raisin of both quality and high yield, grape bunches must be harvested at full ripe stage using seedless varieties. After the harvest, the sorted out bunches are spread evenly on perforated trays with steel mesh, and then placed inside an airtight chamber called 'sulphur box'. The bunches are then exposed to fumes of sulphur burnt at the rate of 10 gms per 10 kg of the fruit for about four hours. Adequate precautions should be taken while the sulphur fuming.

Three methods - sun, shade and electric drying - have been used for drying, and the colour of raisins thus obtained was found to be dependent on the method used. Among the three methods, shade drying has been recommended in view of the prohibitive energy costs and also the raisins obtained will be of attractive golden colour.

Soon after drying, the raisins should be separated from the dried bunches and then washed in lukewarm water. The important factors that affect the yield are the total soluble content of fresh grapes and the moisture content of grapes.

PTI Science Service 3(24), 1984, 16

17 Splitting milk sugar

A process which will enable liquid dairy products to be marketed with less added sugar is to be developed commercially in Australia.

The Australian Minister for Science and Technology, Barry Jones, said the venture involving CSIRO and four collaborators could be worth more than $3 million per annum to the Australian dairy industry.

Mr Jones said the process involved splitting the milk sugar lactose in dairy products into its component sugars, glucose and galactose, which naturally produces a much sweeter taste.

"This will enable almost all liquid dairy products to be marketed with an acceptable level of sweetness with less added sugar." Mr Jones explained.

The officer-in-charge of CSIRO's Dairy Research Laboratory, Lawrie Muller, said that lactose, the major component of milk, was particularly

important for its contribution to the flavour and energy value of dairy products. However, in existing dairy manufacturing processes, much of the lactose was lost in whey which posed a considerable problem in disposing of it as waste.

"One means of increasing the value of whey so it becomes a highly marketable product is to give it this new treatment," Mr Muller said.

He said developments in recent years of so-called immobilised enzymes had offered the opportunity to reduce the cost of processes which could split lactose.

Food Technology in New Zealand 19(9), 1984, 7

18 Hydrolysis system

Hydrolysis system, called Damrace , allows the lactose in ultrafiltered whey and milk permeate to be converted to glucose and galactose, which can be used as a sweetener or fermentation substrate. Damrace is a continuous flow-through immobilized enzyme reactor system. It hydrolyzes lactose in whey and milk permeate to produce a sweetener that can replace sucrose and various corn syrups in dairy and food products. The system can also convert whey and milk permeate to a fermentation substrate, which can be concentrated to a syrup or dried to a powder. The Damrace system utilizes a microporous PVC-silica sheet (MPS sheet) for continuous catalytic reactions. For more information, write to Damrow Co., Div. of DEC International, 196 Western Ave., Fond du Lac, WI 54935

Food Technology 38(11), 1984, 127

19 New culture for yoghurt

The GB Pant University of Agriculture and Technology, Pantnagar, has developed a technique for producing yoghurt like products from soyamilk using new bacterial cultures for fermentation. This method of fermentation of soyamilk by those cultures was found to be superior to those commonly employed to yield yoghurt.

One of the difficulties in the use of lactic acid bacteria (being used as a traditional fermenting agent) is that half of the

carbohydrates present in soyamilk remains unused and is not convertible with these bacteria. These scientists found that this difficulty can be overcome by the combined use of *Streptococus thermophilus* and *Lactobaccillus acidophilus*. But this needs prior fortification with 1 per cent sucrose.

The common fermentible carbohydrates in soyamilk are sucrose, raffinose and stachyose. Their concentrations in soyamilk are less than 1 per cent whereas in soybeans are present to an extent of 5 per cent and raffinose and stachyose to an extent of 1.1 and 3.8 per cent respecti Whereas certain *Lactobacilli* can ferment these carbohydrates present in cow's milk to about 5 per cent, these are unable to bring about fermentation of these sugars by more than 0.5 per cent. The scientists held low generation of acids responsible for poor utilisation by the lactic acid bacteria.

To overcome the difficulty, these scientists supplemented soyamilk with sucrose since the latter ensures better acid production. They found that greater amount of acid is produced by the combination of *S. thermophilus* and *L. acidophilus* than by either culture. They further reported that changes in pH can be attended with addition of skim milk by an extent of 30 per cent. The mixed culture (acidity 0.70 per cent pH 4.3) is superior to either culture in this regard of acidity too. *S. thermophilus* has acidity of about 0.58 per cent, the pH of which is 4.5 and *L. acidophilus* has acidity of about 0.63 per cent of pH 4.5

These investigators further reported that although addition of skim milk can be beneficial for fermentation of the carbohydrates of soyamilk by increasing acidity it cannot be added. When its concentration exceeds 20 per cent, it weaknes the body of the product.

PTI Science Service 3(21), 1984, 14

20 Starter culture for cheese

Lyophilized Dairy Starter for direct vat inoculation is called EZAL.1 These cultures may be used for making varieties of American cheese, and they maintain full activity for 6 months if stored at temperatures below 50 F. EZAL cultures are produced as single strains and are then mixed in specific combinations. Each culture may be used repeatedly from 2-7 days without rotation, according to the distributor. They are in a free flowing powder form,packaged in aluminum plastic laminate packets. Product is available from Dederich Corp., W194 N11411 McCormick Dr., Germantown, WI 53022

Food Technology 38(10), 1984, 128

21 Higher meat recóvery

Some 15,000 tonnes of meat could become available each year in a form suitable for higher-value processed meat products, according to a Meat Industry Research Institute of NZ report.

New technology being developed by MIRINZ may allow economic recovery of about half the residual meat which is at present left on bones using current boning-out procedures.

The process works as follows: edible grade bones and trimmings are rendered in the MIRINZ low temperature rendering system to produce tallow and decanter solids (defatted protein material).

The meat fraction of the decanter solids is then separated mechanically from the bone. Mechanical meat separators generally force the meat/bone material against a perforated screen which 'sieves' out the bone.

The resulting mechanically separated meat has been found to be very acceptable for use in canned pet food but has not been evaluated for human consumption.

Full details of the trials are given in MIRINZ 824 available from the institute, Box 617, Hamilton.

Food Technology in New Zealand 19(4), 1984, 7

22 Carbonated beverage-maker goes everywhere

With "Mr. Soft Drink" consumers can make their own carbonated beverages at home, at the office, on the road, or in their own backyard. Designed to produce two litres of soft drink in less than two minutes, this device is said to be simple and fun to use. Features include syrup pack, carbonation cartridge, and two refreezable ice packets that fit into the base to keep drinks cold up to five hours. Cola, diet cola, orange, root beer, lemon-lime and grape flavors are available. Licensees are sought Contact: Carl V. Santoiemmo, Pres, Norcal Products, Inc. 761 Beta Dr., Cleveland, Ohio 44143 U.S.A.

Relevant Technology 1(3), 1984, 3

23 Membrane filtration adapts to beverage processes

Membrane filtration, i.e. the liquid separation process of reverse osmosis (RO) and ultrafiltration (UF), has a number of applications in the beverage industry.

RO concentrates a liquid by letting only water or solvent pass through a very dense membrane.

UF uses more "open' membranes which split (fractionate) the liquid. Water or solvent plus low-molecular compounds pass through the membrane, whereas the high molecular compounds are retained and thus concentrated.

One of the high-cost areas in the traditional processing of apple juice is the removal of starch and pectins. This is usually achieved with settling tanks and diatomaceous earth filters.

The DDS RO system is a simpler and more economic method of achieving the same result.

For refining apple juice, the product flows across the membrane and all the higher molecular components, i.e. pectins, starches and all forms of cloudiness, are retained and the lower molecular weight compounds pass through the membrane.

The juice which has been thus treated in the ultra-filtration plant is sparkling clear with no tendency for precipitation or cloudiness during storage.

The experience from commercial plants operating in Europe on apple

juice shows that the loss of juice in the ultra-filtration refining process is less than 1 per cent and that the running costs of such a plant are approximately one third those of a traditional system.

A common problem in wine production is lower than desirable sugar content in the fruit juice, grapes or other fruit. A common solution is the addition of cane or beet sugar before fermentation. Water removal is an alternative method of raising the sugar percentage.

The DDS RO system of reverse osmosis can be used to remove water from sugar solution. The juice is pumped through a number of thin flow channels on one side of the membrane. Some water passes through the membrane, but all the other constituents are retained.

Thus when the juice leaves the flow channels the required amount of water has been removed and the sugar content increased to that required for successful fermentation.

There are a number of good reasons for reducing the alcohol content of beer.

The DDS RO system can be used to remove the major part of alcohol in beer, without noticeable loss of aroma or flavour.

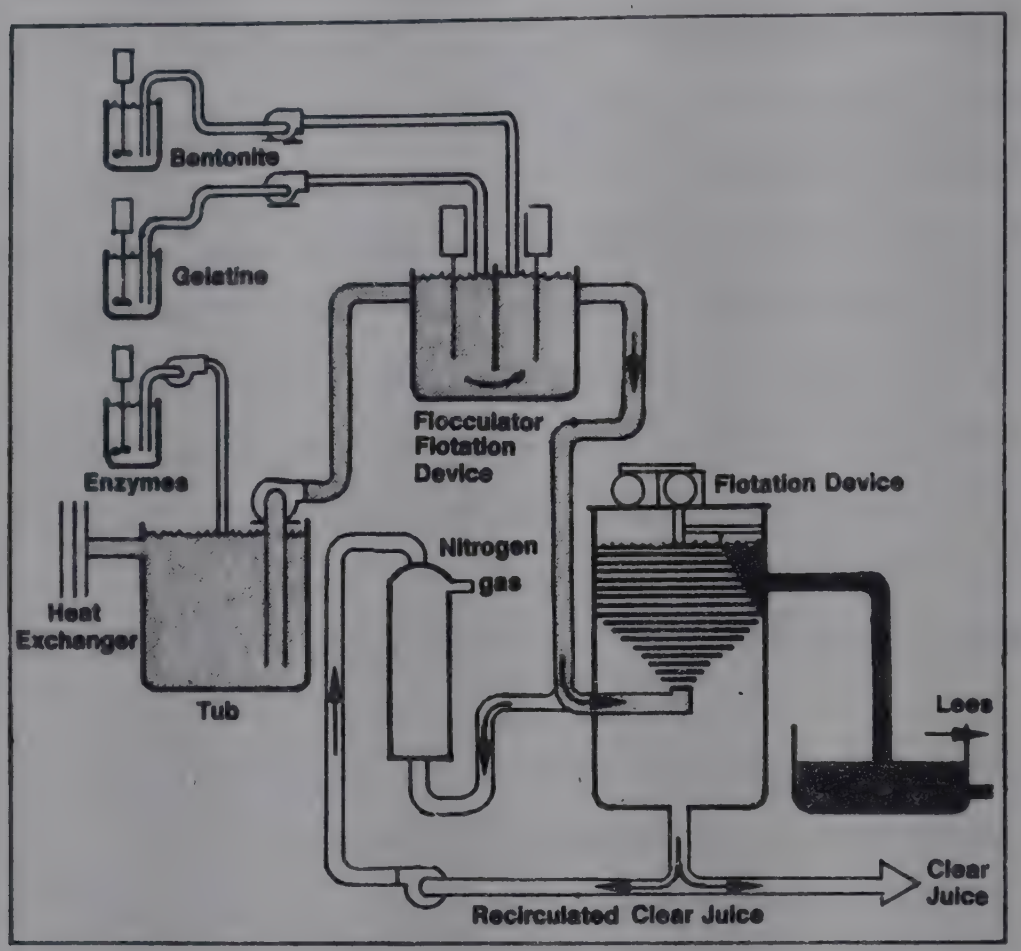
For production of low-alcohol beer, the product flows in a channel over a membrane which allows only alcohol and water to pass through it. When the beer leaves the flow channel, most of the alcohol and a small portion of the water has been removed. If required, the volumes can be restored by addition of water.

The process is used in several European breweries for production of low alcohol (2-3 per cent) "light" beer. In one case the system is used to fully remove alcohol from beer for export to Middle East countries.
Niro Atomizer (NZ) Ltd, 300 Parnell Road, Box 37 239 Parnell, Auckland 1
Food Technology in New Zealand 19(6), 1984, 23

24 Quicker juice clarification

Clarification has always been a bottleneck in juice processing. And while other areas in the processing cycle have been improved (must extraction, and the use of enzymes for final clarification), very little has been done with clarification itself.

Now a Canadian firm has devised a way to speed up clarification. Instead of the usual 6-16 hours, this new technique takes only 1-2 hours. Yields improve 2-5% according to the company. Labor can be reduced. Over refining and excessive use of enzymes is all but



eliminated. And filtering-agent quantities can be cut 90% compared to the total filtration of the coagulated must.

Apple juice is a good example of now *Clarifruit* works. Fruit clarification is broken down into three all-encompassing steps, depectinization, flocculation and sedimentation.

Depectinization, the first step, destroys colloidal protectors. Pectin enzymes and amylases (if necessary) are continuously injected into the must. The quantities added are controlled by a viscometer reacting to the must. Enzymes are added at 50 C.

The next step is flocculation, or mixing. Juice is pumped to a two-part flocculator and mixed for 4-8 minutes. Gelatine is added in the first half of the flocculator, and betonite in the second. After mixing, the solution is left in the tub to homogenize.

The final step is separation. The most important part of this step is adding nitrogen under pressure. When the pressure is released, bubbles form which carry away must particles.

Nitrogen isn't introduced directly into raw juice. It's added to a portion of clear juice, which is then mixed into raw juice. After flocculation, raw juice travels from the flocculating tub to another tub with a flotation device. During its journey from tub to tub, the raw juice stream is joined by a small amount of clear juice from the flotation tub. This clear juice contains nitrogen gas under pressure (50-75 psi). Clear juice mingles with "raw" juice just before both enter the flotation device.

As the mixture enters, pressure decreases, and nitrogen bubbles form. The coagulated must and clear juice move upward, diffusing in a coneshaped pattern. The nitrogen bubbles attach themselves to must particles, pushing them to the surface. The clear juice then sinks to the bottom, where a portion is drawn off and injected with nitrogen to start the process over again.

A mechanical device cleans off must particulate (mud or lees) at the top of the flotation device. The lees gathered on the surface are at least twice as concentrated as those of classical sedimentation, according to the company.

The firm offers different services to help users. Complete evaluation of the flotation process - to test the ability of must to flocculate and float - is one service. Another is the pilot plant. Still another is training operators and staff. Testing includes fining optimization, and stability test. - Lassonde Technologie Inc. Rougemont, Quebec. Canada.

Food Engineering International September, 1984, 69

25 Automated juice pasteurisation

Citrus juice and other types of juice containing floating pulp or fibres can now be pasteurised in a fully automated process.

Alfa-Laval's juicytherm juice pasteurisation plant is now available

for the first time in New Zealand complete with an Alert 5 process controller and the H7 plate heat exchanger which features Alfa-Laval's snap in gaskets.

The Juicytherm process is divided into three sequences.

First comes pre-sterilisation where heated water is circulated through the system for 30 min.

In the production sequence the product is pasteurised at the required temperature which is monitored so the sequence can be automatically stopped if the temperature drops.

After pasteurisation is completed, the product goes straight to the packaging plant and the cleaning sequence begins.

A full cleaning cycle takes about 70 minutes and involves rinsing with water, back flushing, circulation of caustic solution and rinsing with water.

All the components of the juicytherm are housed in a single frame except for the plate heat exchanger which is positioned on the floor next to the frame.

The main components are product balance tank product feed pump, water balance tank, water feed pump, plate heat exchanger for heating water, plate heat exchanger for pasteurisation of product, product holding tube. Alert 5 process controller.

Heating and cooling are accomplished by thermal exchange with water in a separate circulating system.

The Alert 5 process controller has been designed by Alfa-Laval specifically for the small food and beverage processing industry.

It is capable of up to 8000 program instructions and has up to 512 inputs/outputs to valves, pumps and so on.

The unit has simulation facilities, automatic documentation of programs and is simple to operate.

The juicytherm is delivered as a completely assembled unit with all internal piping and electrical wiring fully tested before shipment. Its

compact dimensions allow the unit to be installed in small floor areas.

Alfa-Laval is the only company in New Zealand supplying snap-in gaskets which are being used in both large and small plate heat exchangers.

Alfa-Laval (NZ) Ltd. Sandwich Road, Te Rapa Box 10-241, Hamilton
Food Technology in New Zealand 19(6), 1984, 22

26 High pungent fraction and colour from Indian chilli oleoresin

Regional Research Laboratory, Trivandrum has developed a process for separating the chilli oleoresin into two fractions and natural chilli colour free from pungency. The main product the high pungent oleoresin having a scoville heat value of over one million heat units, can be used for pharmaceutical purposes while the chilli colour free from pungent can be used for colouring food products. The by-product which is a chilli seed oil can be used for edible purpose and also can be added to pickle. While the solvent extracted residue from chilli seed (chilli seed cake) having a protein content of 27-29% can be used as a fertilizer or as animal feed.

In the process dry chilli with 8-10% moisture is fed into the pin mill and crushed and fed into a sieve separator where the chilli pericarp along with stalks is separated from the seeds. The chilli seed which contains 3 to 5% of the pericarp can be freed if it is fed by air classification.

The chilli pericarp is dried at controlled temperature and then ground to required mesh in a disintegrator, and packed in a battery of percolators where extraction of oleoresin is done by counter current extraction method with solvent continuously fed from the top. A part of the extract coming down is pooled up for desolventization. The remaining is crushed and then processed for solvent extraction. The oil obtained is freed of oil solvent by distillation. The recovery of solvent from the extractor is accomplished by steam distillation. The product obtained after subjecting to quality control examination can either be packed in high density polyethene carboys or canned in tins.

The main raw materials required for the process are good quality dry red chillies, ethylene dichloride and hexane, alcohol. All the items are indigenously available. The main items of equipment required are pin mills, percolators, disintegrator, air classifier, driers, condensers, sieve separators, expellers, centrifugal extractors, and vacuum pump, stirrer, boiler, chilled water unit and pumps. All these equipments are indigenously available.

The cost of production for a plant of one tonne of whole chilli/day capacity is estimated at Rs 11,800.

Invention Intelligence 19(6), 1984, 268-9

27 Magnetic water treatment removes hard scale

How often have you been daunted at the thought of once again having to the scale build up from the inside of your laboratory still?

Fitting a half inch CEPI (Conditionment Electromagnetique Par Indication) unit to water intake of your still now provides a permanent solution to this problem, according to the distributors, Applied Instruments Ltd.

The CEPI process consists of passing water to be treated through a specially shaped, very powerful magnetic field. The electric potential thus induced on the water modifies the crystalline structure of the hardness salts which are in a solution so that during heat transfer they precipitate out as a fine amorphous non-clinging powder instead of an adhering hard scale.

The beauty of this treatment is that it requires no electric power, chemicals or supervision. Its capital cost is small and no maintenance is required as there are no moving parts.

As the treatment does not affect the chemical properties of water its potability is unimpaired.

Magnetic treatment of water to prevent the formation of hard scale is not a new technique although many people in New Zealand may not be familiar

with it. Originally developed 30 years ago by Epuro Ltd, a Belgian water treatment company, it is now being used in over 50 countries to protect a wide variety of industrial plant.

Around 100 CEPI units are now operating in New Zealand the largest to date being five inch diameter.

Applied Instruments Ltd, 47 Leonard Road, Mt Wellington, Box 62 010 Sylvia Park.

Food Technology in New Zealand 19(6), 1984, 51

BYPRODUCTS AND WASTE UTILIZATION

28 Methanol from citrus fruit

An economical method to extract methanol - present in the pectin of citrus fruit as the chemical methoxyl - has been evolved by Shangtian Yang, a research associate at Purdue University's Agricultural Engineering Department (West Lafayette, Ind). In the new route, dried orange or lemonpeel is cut into small pieces (about 0.5 cm) and soaked in a solution of sodium hydroxide to liberate the methanol. Fuel-grade methanol is then recovered from the aqueous solution by distillation.

The process can be integrated into existing juice-making plants, since these typically extract only about 25 kg of juice from 45 kg of oranges. Yang proposes to obtain his raw material by separating the peel from the waste-about 2.5 to 5 per cent of the total solids content of citrus peel consists of methoxyl, the raw material for methanol. The remaining pulp is sold conventionally as animal feed.

It is estimated that a plant processing oranges can increase its earning by 10 per cent of what it gets by selling the waste as animal feed. The capital cost of the methanol facilities is estimated at $ 9,600 and operating costs at about $ 5,000 a year. The process has been tested at the laboratory scale but there are as yet no plans for scaleup.

PTI Science Service 4(4), 1985, 20-21

29 Edible oil from straw and molasses

A mill which can extract edible oil from molasses and straw will be set up at Ghaziabad early next year.

The technology for the process was developed by experts at the Indian Institute of Technology, Delhi. The mill would be set up by a leading industrial house. One tonne of oil could be extracted from ten tonnes of molasses and the average cost of production would be Rs. 8 a kilogram of oil.

The Hindu 8 Dec 1984

30 Wastes could become high-protein food

A system for converting effluents into a high-protein yeast concentrate used for animal feeds is being developed by Dr Peter Henry, a researcher at the University of Queensland. Henry, who works at the University's veterinary science farm, has devised a process, called Bio-Wastech, which has the potential to transform negative value effluents, including factory wastes and human sewage, into positive-value products.

Bio-Wastech would be particularly valuable for treating alcohol distillery waste, which left the still as a very acidic liquid with a high mineral content.

Initial testing showed that distillery waste could be converted to edible yeast concentrate, leaving a harmless disposal residue that could be returned to the earth.

Henry has also been working to adapt the Bio-Wastech process for use by a company producing apple juice, whereby the remaining apple pulp can be converted to yeast.

He said *Candida ingens*, the yeast culture grown on wastes, is a rich protein source equivalent to meat meal and soyabean meals, with significant quantities of calcium, phosphorus and B group vitamins. Pigs, dogs, rats and mice appeared to relish it. He had taken the process from ruminants themselves. "When a cow eats grass the grass ferments to produce organic acids and the cow uses the organic acids as an energy source to produce milk and meat," he said. 'I've used the same principle in converting wastes to protein'.

PTI Science Service 4(3), 1985, 20

PROCESSED PRODUCTS

31 Cheaper and better alcohol

A new alcohol filtering agent, which also improves taste and smell, has been developed by Alko, the Finnish State-owned alcohol company. Distillers making alcohol from molasses, as in developing countries with sugar factories, can improve quality and purity at lower cost. The filtering eliminates unwanted odours associated with alcohol made from molasses. The filtering substance is offered either in bulk or through licence manufacturing agreements. Potential customers are also being invited to send their samples to Alko for testing. Alko sees the development as a pioneering step forward in quality improvement. Currently almost 50% of world alcohol produced from sugar cane juice or molasses, is considered to be of medium quality.

Alko is exporting its know-how in the fermentation industry throughout the world. A distillery producing 120 000 L/day in Hungary, and a new Swedish distillery producing 20 000 L/day will open this year. Another turn-key project, in Burma, involved the planning, start-up and test-runs of a molasses distillery producing 5000 L/day will come on stream.

Other projects have been completed in Ethiopia, Italy, Thailand, Switzerland and the Sudan. More than 16 million bottles of Finlandia vodka, produced by Alko, are exported annually, making it one of the major international brands of vodka.

Further information is available from Oy Alko Ab, Process Engineering Division POB 350, SF-00101 Helsinki 10. Finland

Food Technology in Australia 35(8), 1983, 358-9

32 Low calorie ice cream

Tapioca dextrin may be used to reduce calories by supplementing oil, shortening and butterfat in the production of ice creams and other frozen desserts. N-OIL is in powder form and can be dry blended with other ingredients and added directly to cold liquids before heating. Butterfat perception is increased 1% with every 0.25% addition of N-OIL which may also be used in whipped toppings, cream sauces, and spoonable or pourable salad dressings. For additional information, contact National Starch and Chemical Corp., Finderne Ave., Bridgewater, NJ 08807

Food Technology 38(10), 1984, 129

33 Raisin juice concentrate

This may be used in milk and other dairy products. This 70 Brix syrup of raisin solubles is self-preserving due to its high sugar solid content and low pH. When mixed with milk, it acts as a natural sweetener, color, and preservative. A report of a shelf-life study of "raisin milk" and data sheets listing the nutrient composition of various types of milk are available from the California Raisin Advisory Board, Food Industry Program, 55 Union St., San Francisco, CA 94111

Food Technology 38(10), 1984, 128

34 Non-alcoholic beer extract

Ex-Bier or Elan Brand non-alcoholic beer has been brewed since 1937. Like beer it is made from hops, malt and spring water. Although brewed with alcohol, it is drunk without Feldschlosschen produce extract for non-alcoholic beer. Using this extract, overseas soft-drink bottlers can produce and bottle a high-grade non-alcoholic beer by adding water and carbonic acid. Feldschlosschen provides consultation regarding the additional equipment and redilution technique. The brewery engineering department is said to be available for technical cosultation and planning. Contact Feldschlosschen Brewery CH-4310 Rheinfelden, Switzerland

Relevant Technology 1(3), 1984, 4

EQUIPMENT AND MACHINERY

35 Food processing line for handling meat, poultry and fish.

Hollymatic AG of Switzerland manufacture industrial and non-industrial sized processing lines for handling meat, poultry, fish and other food products at the rate of 1,000 kg/hour. The production process starts from the frozen meat block and follows through grinding-mixing grinding-portioning to freezing and packing. Processing requires frozen block slicers and lift loaders to prepare the frozen meat blocks for further processing; floor scales for batching; frozen meat grinders that pre-grind the product to 10-13 mm size, transfer conveyors, mixer grinders that mix the product with seasoning while grinding the mixture to 3-4 mm size; ice flake machines for producing ice flakes, to be added to the product during mixing; and portioning machines for forming and portioning ground meat products into different shapes, weights and thicknesses.
Each patty is interleaved with a waxed paper, and stacked to a pre-set height. The equipment can be imported under OGL. For further information write to: Vindhyachal Process Corporation,116 Malviya Nagar, Bhopal, Madhya Pradesh 462 003

Industrial Products Finder 13(Annual), 1984, 239

36 New ESM rice sorter

The Electronic Sorting Machine Operation of Geosource Inc is introducing the 38X, a new version of the Megasort-38 colour sorting machine. Like its predecessor, the 38X will be used primarily to inspect rice to ensure that defective product and extraneous matter are removed after processing and before packaging. The 38X offers substantial capacity improvement over earlier models, with long term field testing demonstrating capacity ranges from 4000 to 7500 lb per hour.

The Megasort-38X colour sorter incorporates a new automatic window wiper, dual feeder systems, individual gain controls and a faster electronic classification process.

ESM/Geosource UK are to be found at 3 Moss Road, Off Freebournes Road, Witham, Essex CM8 3UQ
Food Trade Review 54(4), 1984, 193

37 Magnetic material separator

Jayashankar Plasticrafts, Kalol, Gujarat, manufacture a magnetic material separator. The machine consists of feeding hopper, tray, high retensity permanent magnet drum, motor and reduction gear box mounted on sturdy MS stand and suitably enclosed. It finds application in separation of ferro-magnetic material from non-ferrous materials. It is available in line and separate unit in different sizes. The machine also finds application in separation of scraps, ceramic and firebrick industries, flour mills and guar gum industries. Sterling Marketing Agencies, Bhagyodaya Building, 1st Floor, 79 Nagindas Master Road, Bombay 400 023
PFNDAI Newsletter 1, 1985, 3

38 Mini-pulveriser

Skylark Engineers manufacture rotary mini-pulveriser with hammer heads, semi-circular anvil and interchangeable sieves. The machine can grind any material, dry or wet, such as wheat, rice, chillies, turmeric, corriander, tamarind seeds, and even hard substances such as seashells, soapstone, etc., to the desired fineness. The output is 4 to 5 times the conventional flour mill. The unit offered, is belt-driven but without electric motor. For further information write to: Skylark Engineers, No. 5 High Street, Belgaum, Karnataka 590 001
Industrial Products Finder 13(Annual), 1984, 423

39 Super-critical gas extraction

Super-critical gases--under controlled temperatures and pressures can be used to extract components from products without the use of solvents. Prime examples include caffeine from tea or coffee, aromas from hops, spice extracts, fats and oils, and alcohol, to name a few.

The resultant extract is free of residue solvents, and it is physiologically clean. And, this process (acronymed SCGE) is economical especially when compared to typical solvent-extraction methods. The process was pioneered, and is being promoted, by UHDE GmbH, West Germany, manufacturer of high-pressure processing equipment.

This unique extraction process, utilizing super-critical gases (liquid phase), promises several advantages to a number of industries but most especially to food processors. Primary among these advantages are the system's low cost and low energy requirements, coupled with its selectivity and non-toxicity.

Examples of current industrial applications for SCGE include the decaffeination of tea and coffee, the extraction of hops' aromas and the production of flavors. Current experience and experimental work also give a favourable outlook to several other SCGE possibilities as well.·
Food Engineering International, November 1984, 40

40 Supercritical extraction

The process of supercritical CO_2 extraction has been shown to be applicable for decaffeinating coffee, extracting flavour from hops and spices and in substituting for distillation in alcohol production.

Selby Scientific advise that Autoclave Engineers have developed the Supercritical Extraction (SCE) screening system for initial studies of the process. Preliminary screening of various materials using a variety of fluids enables the researcher to become familiar with the capabilities of supercritical extraction phenomena. Using the SCE system, the researcher can identify specific separations for further study in more sophisticated pilot plants before production processess are finalised.

Further information is available from Selby Scientific, 352 Ferntree Gully Road, Notting Hill, Vic. 3168

Food Technology in Australia 36(6), 1984, 268

41 Plate heat exchangers

HMT Limited manufacture plate heat exchangers suitable for pasteurising, heating or chilling of various products. They are available for various flow rates, with necessary accessories. They have high regeneration efficiency and thereby reduce steam consumption, it is reported. The plate frames are available in either SS cladded or MS painted and the plates in either AISI 304 or AISI 316. They can be used in the food and chemical industry, and in thermal power stations. For further information write to: HMT Limited, Dairy Machinery Unit H-2 MIDC, CIDCO Colony P.O. New Aurangabad, Maharashtra 431 003

Industrial Products Finder 13(Annual), 1984, 221

42 Scraped surface heat exchanger

Danton Engineering advise of the availability of the Fryma Coolmix, a unit that combines heat exchange with mechanical motion an essential in the handling of products such as fats, margarine and peanut butter which tend to harden on cooling. Instead of occupying a processing tank with cooling jacket and stirrer for hours on end, the product is cooled in the Fryma-Coolmix, either quickly or slowly in accordance with the structure of the product, then immediately filled or put into storage. An outstanding feature of the unit's design is its minimum space requirement. Further information is available from Danton Engineering Agencies, 35 Maggs Street. Doncaster East. Vic 3109.

Food Technology in Australia 35(8), 1983, 355

43 Aseptic heat exchanger

Cherry Burrell has introduced a high velocity aseptic tubular heat exchanger called 'Spiratherm' which offers efficiency and aseptic integrity in heating, cooling and holding for a wide range of liquid products. It comprises either trombone or piral product channels sealed within media tubes and is constructed from heavy duty 316 stainless steel with no gaskets or seams to fail.

The product passes through the heat exchangers at a very high velocity which increases the heat transfer ratio and therefore improves the flavour, as the product is exposed to high temperatures for a shorter time. In addition, the resultant turbulent flow produces a natural scrubbing action that reduces product build-up and dramatically increases the process run time and productivity as cleaning cycles are not required.

The units are available in entire modular systems called 'Unitherm' prepiped and prewired to ease installation and maintenance with all the necessary equipment skid mounted including product supply tanks, homogenisers, deaerators (optional), heat exchangers and controls.

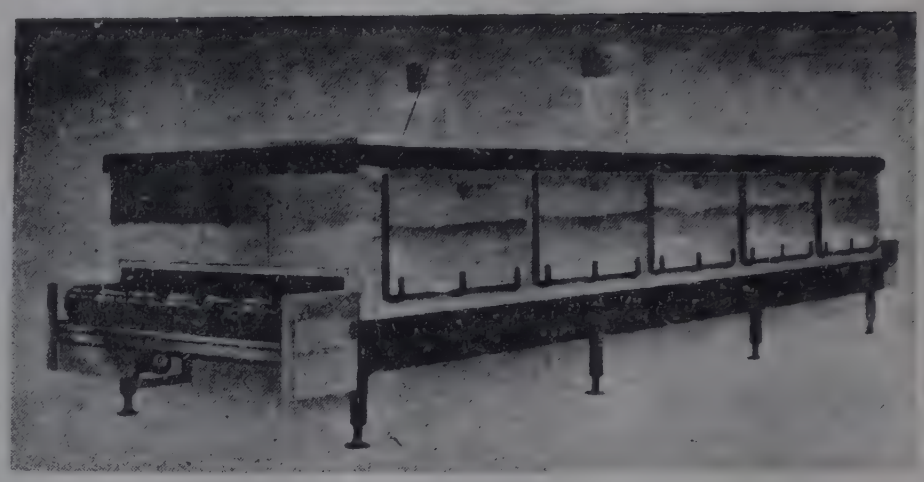
The systems range from manual to completely automatic and can be sized to meet any required volume. Larger units can feed one or more aseptic packaging machines, with the process volume automatically controlled to alter throughput should an interruption occur in the process line. For further information contact Aerogenerators, Alton, Hants

Food Processing June 1984, 48

44 Tunnel freezer

KKI offer the Turbo-Runner tunnel freezer which consumes only 0.12-0.15 kWh -per kg of products such as dough, confectionery, meat, fish and snacks. The casing is made of 12 cm thick thermally insulated polyurethane panels. The entire unit is mounted on a supporting frame work with adjustable legs. The inside of the tunnel is made of stainless steel. The conveyor belt, stretching drum and driving drum are also made of stainless steel. The installation is driven by a separate drive unit with a continuous speed regulator with remote control.

As soon as the last product is frozen the tunnel can be defrosted immediately. A number of tunnel cleaners scrapes the rinsing water and product residues out of the tunnel and removes them automatically. The total capacity of the quick-freezing or cooling installations is built up from a number of MER units, which together give a capacity of over 1,000 kg/h. The entire operation protection and control of the automatic defrosting, cleaning and drying of the installation is governed by a central control panel. The tunnel segments are 3.0 or 4.5 m long and 2.3 m wide and are joined together in position. This sectional construction means that it is always possible to increase capacity. For further information write to: Komo Koeltechnische Industrie B.V. Energieweg 2-Roermond, 6074 NG Melick, The Netherlands.



Industrial Products Finder 13(Annual), 1984, 439

45 New refrigeratior/freezer powered by the sun

The "RR-2" is a solar powered refrigerator/freezer designed to store vaccines, medical supplies, food, and beverages anywhere in the world. According to the company, the "RR-2" can operate efficiently from a small photovoltaic array and other sources of d.c. or a.c. power such as wind and hydro energy systems. This highly reliable, lightweight appliance sells for $995. For further information contact Arthur D.Sams, Vice Pres, Polar Products, 680 Stone Canyon Rd., Los Angeles, California 90077 U.S.A.

Relevant Technology 1(3), 1984, 8

46 Batch freezers are low cost

Gardena, Cal - A new line of smaller, fast-freezing batch freezers utilizing liquid nitrogen or carbon dioxide cryogenic gas are ideally suited to smaller food processors, ones with sporadic freezing needs, and cook-freeze caterers. Advantages of the cryogenic gas systems over conventional refrigeration units are economy and simplicity.

The units occupy 4 x 4 ft, cost one third of cryogenic tunnel freezers, and are available on lease programs. They accept 24 standard trays and freeze up to75-1b. loads in 15 minutes, retaining moisture and preventing over-cooling. Cryo-Chem Inc., 13630 St. Andres Place, Gardena, Cal 90249 USA

Food in Canada 44(6), 1984, 34

47 Stripping columns for scaling processes

The stripping of vapours or gases from solutions, frequently results in a simultaneous precipitation of solids. In many cases, the production of solids is even the purpose of stripping. However, since this often gives rise to scaling problems, operation must be interrupted to clean the column.

Sulzer has recently developed a stripping column to avoid this problem. Using a specially developed column tray (Type B) scaling can be largely prevented.

Tray efficiency is nevertheless very high. At full loading it reaches almost 100 per cent. Load variations do not present any problem either, because the column operates satisfactorily even if the loading is as low as 20 per cent, the manufacturer says.

In most cases, these columns can be designed on the basis of experience with similar systems. Tests are recommended, however, for new applications. - Gilbert Lodge, 356 Church Street, Box 12743, Penrose.

Food Technology in New Zealand 19(6), 1984, 47

48 Process pump has adjustable packing

Tuthill offer the new Series 4200 process pump with an adjustable packing design for food, chemical, petroleum, and other applications. The pump comes in five different models with nominal capacities from 22.75 to 318 LPM. It is furnished with an integral mounting foot. Designed for direct drive service, the pump has a Woodruff keyway shaft. Lead packing is furnished as standard, but teflon packing may also be provided. Like the other pumps in Tuthill's Series 4000, Series 4200 pumps are based on the internal gear principle. Bearings of a special carbon-graphite resin material and special seals are among the many extra design features. For further information write to: Tuthill Corporation, Tuthill Pump Division. Dept. RN 12500 S. Pulaski Road, Chicago, Illinois 60658, U.S.A.

Industrial Products Finder, 13(2), 1984, 131

49 A stove to store heat

A heat storage cooker is a stove which stores heat for the later use.

From Colombia comes a heat storage cooker that stores excess electricity for future use. The design consists of a flat topped cast iron heat storage block in which electrical heating elements are placed. This block is suspended in a highly insulated box. The flat exposed top surface is then covered with a removable insulated lid. In operation, the electric elements needed for cooking the insulated lid is removed, exposing the flat cooking surface. By using two electric circuits in various ways, four power settings from 1 to 400 watts are available.

The operating costs to the user is only a little more than the cost of fuelwood (in certain areas, it could even be lesser). It has the advantages like cleanliness, absence of smoke etc.,

Asia-Pacific Tech Monitor May-June 1984, 29-30

50 One stage solar drying for paddy

The traditional paddy harvesting system in Korea consists of a two-stage drying operation. The first stage consists of laying the paddy on the ground, bound in small bundles and lined up for open sun drying. The second stage, done only when further drying is necessary for marketing and storage, involves placing a thin layer of the threshed paddy on straw mats or on a paved ground.

A comprehensive study of post production rice systems in Korea has been conducted by the Seoul National University which has resulted in the development of a low-cost method for drying paddy during storage by means of solar energy.

Round steel bins of diameter 2 m and a height of 1.8 m are installed with a perforated floor and equipped with 1/2 h.p. motor to operate the vane-axial fan for aeration. A loading gate is provided at the upper portion of the bin and unloading gate at the lower portion.

One of the bins is retro-fitted with a solar collector with rock pile heat storage for supplementary heating. The flat plate solar collector is covered with polyethylene film. The collector area of 27.7 m^2 is inclined 48° from the horizontal Black rocks with a volume of 7.2 m^3 are used both as heat absorbers and storage medium. They are piled in a perforated metal duct. 45 cm in diameter and 8 m long. A centrifugal fan installed between the grain bin and the solar collector forces the heated air through the grain mass.

With an average daytime temperature of 20 C and a relative humidity of 65 percent, the paddy grains dry down to a moisture content of 14 percent in 12 days.

Asia-Pacific Tech Monitor May-June 1984, 29

51 Solar drying for groundnuts

The Khon Kaen University (KKU) has to its credit four types of solar groundnut dryers which improve the traditional drying methods vastly. These are the AIT-type, cabinet type, box-type, and tent-type constructed from locally available materials..

The AIT type dryer is made from clear and black plastic sheets, bamboo and burnt rice husk. It has four trays with 5.48 m^2 total tray area and 25.4 m^2 total collector area.

The cabinet type solar dryer is made of plastic sheets and a light grade steel frame. This model also has four groundnut trays, stacked one on top of the other. With a total tray area of 3.12 m^2 it can hold 0.22 m^3 of groundnuts.

The box-type solar dryer is of two varieties. They have a tray area of 2.6 m^2. The capacity of each dryer is 0.32 m^3 and the secondary collector areas are 2.14 m^2 and 1.95 m^2 respectively. The dryers are made of plastic sheets and light grade steel frames. The floors of both dryers are covered with 3 cm thick small gravel on top of the black plastic sheet.

The tent-type solar dryer is made from plastic sheets glued into a bamboo frame and the floor is covered with 3 cm thick small gravel on top of the black plastic sheet as in the box-type dryers. The dryer has 16 groundnut trays making a total tray area of 14·11 m^2 and a loading capacity of 0.85 m^3 .

Asia-Pacific Tech Monitor, May-June 1984, 29

52 New high speed biscuit dough mixer

A new high speed mixer which offers a full range of features has just been announced by Baker Perkins. The 550 HS is a high output multi-purpose batch mixer suitable for all types of biscuit dough. Its high speed capability aids the rapid development of hard biscuit doughs. Low speeds are used for initial mixing, or for the production of soft doughs.

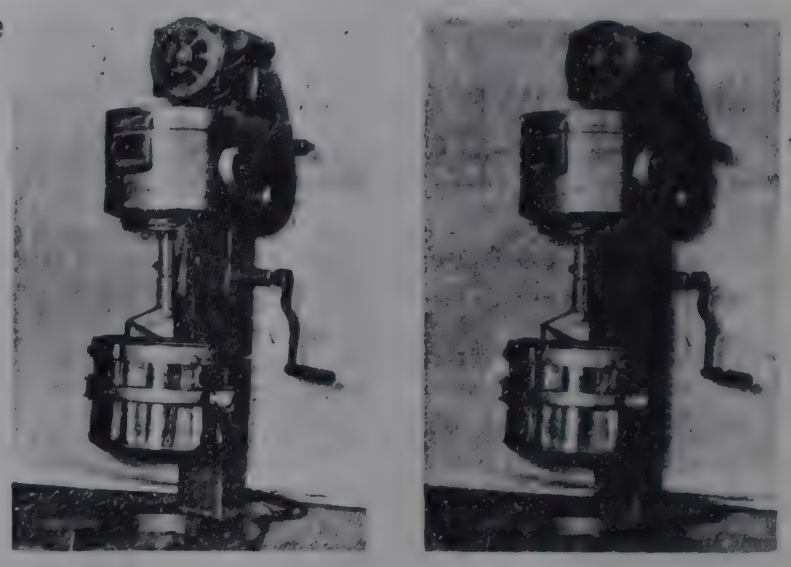
The standard controls allow high/low speed mixing under the direct control of the operator; automatic time control by electronically linked low speed and high speed process timers; or automatic dough development control by accurate sensing of dough temperatures.

A full range of feeds are available to permit automatic loading and the mixing bowl tilts to allow hand feeding of ingredients. The mixing bowl surfaces in contact with the dough are made of stainless steel and a section of the bowl is double-skinned in the form of a water jacket.

The output of the new Baker Perkins mixer will depend on the dough formulation and the degree of automation of the ingredient feeding process. Batch quantities will normally range from 470-550 kg of dough.
Food Flavourings, Ingredients, Processing, Packaging 6(2), 1984, 9

53 Planetary mixing and kneading machine

NT offer a planetary mixing and kneading machine for handling viscous pasty materials, including those in the higher viscosity range. The machine is suitable for mixing of ingredients which develop a high yield value during the initial stage of mixing and for diluting colour matching of pastes. Available in 50, 100, 200 and 500 kg capacities, it also finds applications in food industries. For further information write to: National Traders E 5 32, Krishan Nagar, Delhi 110 051



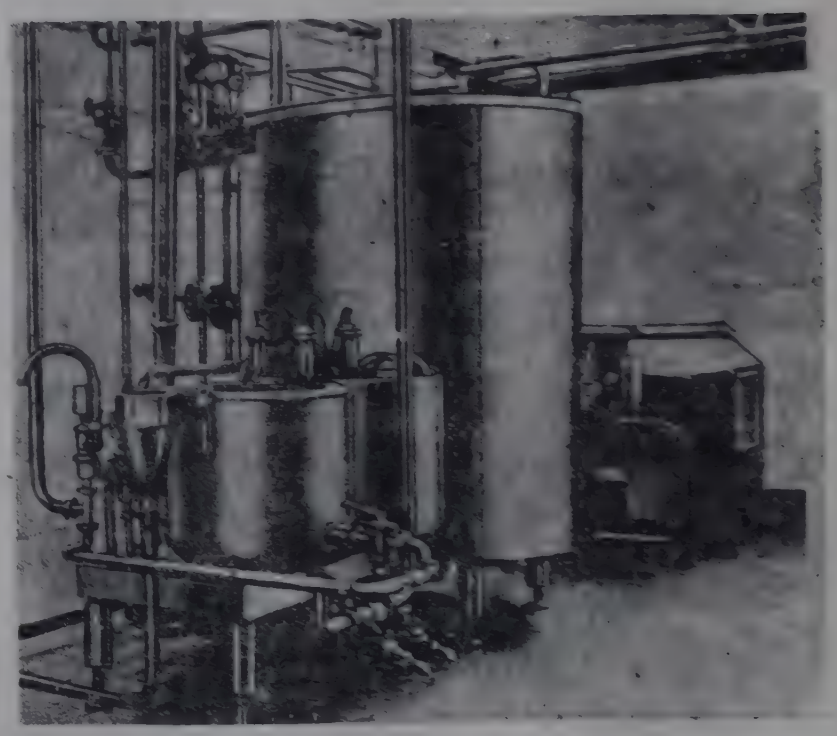
Industrial Products Finder 13(Annual), 1984, 569

54 Industrial oven for bread

Gefra have developed ovens for industrial bread bakeries. The unit features electronic speed control which means that the baking time can be adjusted continuously to give optimum result. The oven is divided into modules, each with a length of 1 to 2 metres, which can be joined together very quickly in the bakery. Fuel consumption is reduced by various measures, including extra insulation, recovery of heat from the combustion gases and a modified radiator design giving better heat transmission. The new oven can be provided with a forced convection system to give even better baking results. For further information write to: Gefra B.V. Postbus 38, 2690 AA 's-Gravenzande, The Netherlands
Industrial Products Finder 13(Annual), 1984, 573

55 Ultra high temperature milk system

Stormac India Ltd. of Ahmedabad offer the Sterideal system for ultra high temperature of milk in partnershi with Stork Group of The Netherlands. The principle of this technology used for milk preservation is based on heating milk-in-stream to ultra-high temperatures for a very short time, thus destroying all organisms which are either pathogenic or which diminish the keeping properties of milk, without affecting the flavour. The product is then packaged and sealed in containers under sterile conditions, increasing shelf life and eliminating problems connected with storing milk under refrigeration. For further information write to: A.T.E. Pvt. Ltd., Stork Dairy Div. 43 Dr. V.B. Gandhi Marg, Bombay 400 023



Industrial Products Finder 13(Annual), 1984, 203

56 Ultrafiltration of milk and by-products

Ultrafiltration technology applied to milk provides protein enriched products (50 to 80% proteins/dry components for the milk; 35 to 75% proteins/dry components for the lactoserum). The catalytic hydrolysis process on ionic resins enables continuous treatment for lactosed solutions. The product obtained is of a high purity grade (over 99%); it is constant because it is independent from the lactosed liquor which is used. The liquid syrup concentrate obtained (60 to 70% dry content and 80% hydrolyzed lactose) is stable in time and avoids expensive drying procedures. Two French companies La Prosperite fermiere and Applexion, who specialize in ionic exchanger research and

applications, have closely collaborated to design, erect, and perfect the industrial installation which-monitored by a programmable automat operates round the clock with a dry product capacity of 3900 kg per day. La prosperite fermiere offer to act as advisers, thus contributing their extensive experience in the dairy industry and also the results of their research work. For further information contact: Regional Agency for Development, Division of Economic Development 185, Bd de la liberte 59800 Lille (France).
Relevant Technology 1(3), 1984, 3

57 HMT SM 20 self cleaning separator for dairy or beverage industry

HMT SM 20 Self Cleaning Separator is clearly designed for use in a modern processing line in large dairies or beverage units. It can be economically operated at capacities ranging from 15,000 to 20,000 litres per hour depending on requirements. SM 20 comes with a self-cleaning feature and finds application in uninterrupted production lines where it can run for 365 days in a year, 24 hours a day. The design provides for collection of milk sludge at periodic intervals with treatments to render it bacteriologically ineffective. Sludge removal is done by programme control timers. HMT Limited H-2, MIDC, Chikalthana I.A. Post Box 20, Aurangabad 431 210.
PFNDAI Newsletter No.1, 1985, 3

58 Butter machine

HMT Limited manufacture the continuous butter making machine that can make white or salted butter at a rate of 800 kg/hr. The composition of the butter can be as per PFA or AGMARK standard. For further information write to: HMT Limited, Dairy Machinery Unit H-2 MIDC, CIDCO Colony P.O. New Aurangabad, Maharashtra 431 003
Industrial Products Finder 13(Annual), 1984, 329

59 Tea processing machinery

The BS segment helix milling-cum-grooving machine has been designed for the dual purpose of cutting the circumferential grooves and milling the helical grooves on the CTC segments of tea. The machine is suitable for operation in areas where the volume of work does not necessitate the use of separate helix milling and grooving machinery. The machine body is constructed of graded cast iron. The bedways and slides are hand scraped for better lubrication and longer life. The machine is powered by a 3 HP motor for grooving 1 HP motor for milling operations. The nickelchrome steel gears are hardened and ground. Standard accessories supplied with the machine include: coolant pump and tank, chuck, milling cutters, chaser, dial indicator, set of spanners, motor, and swarf tray. For further information write to: B.S. Industries, 435, Jessore Road, Calcutta 700 055

Industrial Products Finder 13(Annual), 1984, 359

60 Tea fermenting drum

Walker and Greig of Coonoor offer a fermenting drum which is an improvement on the existing rotating drum used in CTC as well as orthodox manufacture. It controls both the fermentation and discharged output. If the machine is used in conjunction with U.V. Fermenter, it is particularly suitable for orthodox tea factories having dual manufacture. For further information write to: Walker & Craig 239, Mowbrays Road, Madras 600 018

Industrial Products Finder 13(Annual), 1984, 385

PACKAGING

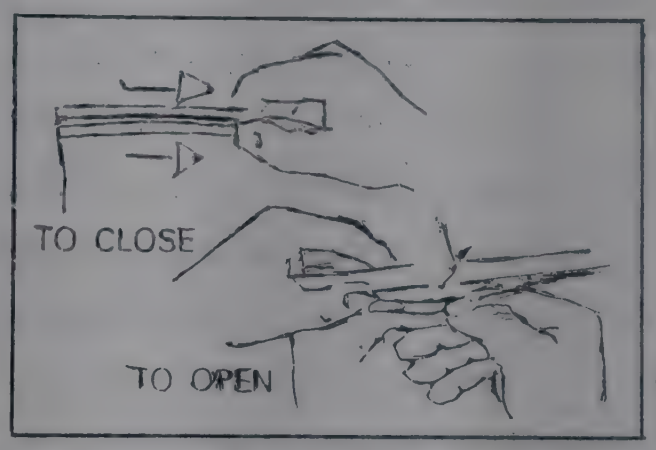
61 Convenient packaging

Papercan Plus may be used for a wide range of product applications including ground coffee, milk powder, instant drinks, soups, cocoa, and more. The package offers minimal storage requirements, wide graphics capability, ease of stacking, reclosable lids, and about one-third

the weight of metal containers. The outer carton is formed from flat, precut blanks. The inner bag with cardboard sleeve and tear-open strip is fed from roll stock and can be formed from heat sealable aluminum foil lamination. These are formed on the Hesser Papercan Plus Machine, Model H-PLDI. For more information, contact Robert Bosch Corporation, Packaging Machinery Division, 15 Seeley Ave, Piscataway, NJ 08854.

Food Technology 38(9), 1984, 63

62 Reclosable polythene bag



Ambaa Corporation offer a reclosable polythene bag in standard sizes ranging from 5.08 x 8.89 cm to 35.56 x 27.94 cm thicknesses of 250 and 300 guage or thicker and in different colours. The bags are suitable for packaging spares and components, chemicals, spectacle frames, food products, jewellery, gift articles, etc. For further information write to: Ambaa Corporation, 8 Sheriff Devji Street, Bombay 400 003

Industrial Products Finder 13,(Annual), 1984, 195

63 Standardised container to transport perishables soon

The Union Directorate of Marketing and Inspection is carrying out trials to develop a standardised container to transport fruits, vegetables and other perishables.

Dr. L. Krishnaswamy, Joint Agricultural Marketing Adviser to the Union Government told newsmen that the centre, with its headquarters at Nagpur, had successfully experimented transhipment of oranges from Warup in Maharashtra to Bangalore. The oranges were packed in collapsible wire bound softwood boxes which could be used eight to ten times.

Financial Express 20 Dec 1984

64 Packaging at high speeds

Three new high speed packaging machines from Rose Forgrave are now available in New Zealand through the local agents Baker Perkins Ltd. These form, fill and seal machines include the RF 355 Flowpak horizontal, the RF 256 Flowpak and the RF 252 Flowpak new horizontal.

According to its manufacturers the RF 252 Flowpak achieves new levels of productivity for reciprocating head horizontal pouch pack machines while retaining high quality seals.

Up to 120 packs per minute can be produced in complex laminates or heavy guage materials by the bakery and biscuit industries. Gas flushing and gas injection equipment can be supplied.

The RF 355 is a high speed, horizontal form, fill and seal machine for small products such as individual bars or biscuits. An output of up to 600/minute can be achieved with an automatic feeding system such as the RF 461/462, other feeding systems include twin cross belts with a multi-chain infeed. A totally automatic line can be completed by a multi packing or boxing off unit.

The RF 256 Flowpak features a totally new design for wrapping biscuits on edge in horizontal pillow pouch style.

Speeds of up to 120 packs/minute can be reached using a Rose Forgrave LMF length metering feeder. Special attention has been given to making size changes quick and simple and for ease of cleaning.
Baker Perkins, Box 23-316, Papatoetoe.
Food Technology in New Zealand 19(6), 1984, 47

65 Aseptic packaging for juice

This is the prediction of Frost & Sullivan for the U.S. market. In a new study of this segment of the food market, Frost & Sullivan estimate that 175 aseptic filling machines will be in operation by the end of 1984.
Cereal Foods World 29(12), 1984, 789

66 Novel coatings

Technical workers at ERA Technology, a company in Leatherhead. (U.K) plans to develop a new type of protective-coating technique for the engineering, food and chemical industries.

The technique to be studied will be a variation on ion plating, which is well known as a way of coating metal surfaces with thin layers of other metals. In this, a metal target is heated to provide a plasma of ions and atoms. These receive energy from the plasma to collide with the surface under treatment upon which a protective layer builds up.

The Hindu, 30 Jan 1985, 19

67 Bulk milk dispenser

An automatic vending machine with a simple mechanisms, to deliver a desired quantity of milk directly to consumers, has designed and fabricated, by scientists at the National Dairy Research Institute (NDRI), Karnal.

The equipment will suit the bulk milk vending system of distribution of milk from dairy to consumers. It eliminates the traditional and costlier method of bottled milk distribution system and is also more hygienic.

The equipment consists of a stainless steel refrigerated receiving tank of 500 litres capacity, an insulated Stainless Steel cylindrical milk delivery tank of 10 litres capacity, solenoid operated milk valve at the outlet of delivery tank, a sanitary type recirculation pump of 600 litres/hr, and an electrical control panel. The delivery tank is housed in a rectangular mild steel cabinet, which can be placed either on a rectangular steel framed table or on a suitable platform one metre above the ground level. The refrigerated receiving tank is located on the ground and can hold 500 litres of milk at 6 C·1 A stainless steel pipe 2.5 diameter with fittings is used to connect the receiving tank to the delivery tank through the circulation pump.

A token switch, used to start the machine operations, is located at the front of delivery tank cabinet. Milk is circulated through the delivery tank by the pump and with the help of an over flow line in the delivery tank, it is returned to receiving tank, maintaining a constant

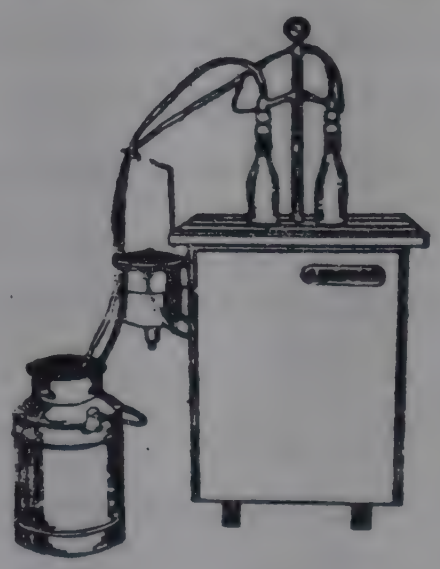
level of milk of 25cm inside the delivery tank. A token, inserted by the customer in the slot provided on the token switch assembly opens the milk outlet solenoid valve. The customer's vessel is placed on a platform located directly below the milk outlet. Since the head of the milk in the delivery tank is maintained constant, the quantity of milk delivered to the customer's vessel is directly proportional to the time of opening of the delivery valve. The desired quantity of milk delivered is controlled by an electronic timer which closes the delivery valve after a predetermined and set period. By suitably adjusting the timing mechanism of the electronic timer, the desired quantity of milk, such as 0.5 litre or 1 litre, at the outlet can be obtained.

The machine has a capacity to deliver 200 litres of milk per hour. A one-ton refrigeration plant is needed to cool and store the milk in the receiving tank at 6 C. The equipment is small in size, compact and easy to clean.

PTI Science Service 3(24), 1984, 14-15

68 Bottle filling machine

The Airovac cabinet model bottle filling machine has arrangements for floor mounting or wheels for mobility. The cabinet is made of mild steel and all the contact parts and the cabinet top are of stainless steel. The machine comprises a vacuum pump, a vacuum guage, filler heads, overflow jar with drain valve, moisture trap and foot valves. It can fill bottles of any size and shape with oil, aqueous solution, liquid, drug, syrup, perfume, liquid soap, lotion, milk, beverage, squash, adhesive, varnish, spirit and chemical. For further information write to: Acmevac Sales Pvt. Ltd. 109 Unique Industrial Estate, Chakala Road, Andheri (East), Bombay 400 093



Industrial Products Finder 13(Annual), 1984, 279

69 Bottle washing machine

Acmevac Sales offer the Airovac bottle washing machine with brushing unit in two designs - "single ended" with two brushes on one side and "double ended" with two brushes on either side. The brushes are so designed as to reach the corners of bottles of different sizes and shapes. The SS soaking tank is rigidly braced at all points. It can also be made of aluminium/GI sheet. The rinser jets are controlled by means of a 9.525 mm BSP ball valve. The machine is available in three sizes of 6, 12 and 24 jet rinser. For further information write to: Acmevac Sales Pvt. Ltd. 109 Unique Industrial Estate, Chakala Road, Andheri (East), Bombay 400 093

Industrial Products Finder 13(Annual), 1984, 363

70 Bottle cleaner

Panchal Workshop offer a bottle cleaner unscrambler, an orbit cleaner which air rinses jars and bottles. After having been unscrambled and conveyed into a single line, the bottles are inverted, then air rinsed continuously over a 90^{o} arc. The bottles are rinsed by an individual stainless steel tube inserted into the bottle's neck. The jars are rinsed by a direct air-blast from a multi-nozzle while inverted. A dust collection pan located directly below the inverted containers has an exhaust port for connection to an external vacuum. The orbital cleaner can be provided with a timing screw. The speeds of the conveyor and the orbital cleaner are variable. Water rinsed units are also offered. This unit can accept a variety of shapes and sizes of bottles and jars, which are not forced to push each other nor gripped or squeezed. They are simply contained within a pocket. For further information write to: The Panchal Workshop, Anand Sojitra Road, P.O. Box 62, Anand, Gujarat 388 001

Industrial Products Finder 13(3), 1984, 115

ANALYSIS

71 Spherical Meter

Spherical Meter for food applications is constructed of corrosion resistant austenitic material with 3-in flanged connections and capacities up to 200 gal/min depending on the viscosity of metered material. Model MS 15 positive displacement meter may be used to measure high fructose corn sweeteners, liquid sugars, vegetable oils, corn syrups, and molasses. The spherical shape provides maximum strength at minimum weight and envelope. More information is available from Liquid Controls Corporation, Wacker Park, North Chicago, IL 60064

Food Technology 38(9), 1984, 63

72 Centrifugal air sampler

Biotest Diagnostics Corporation, 6 Daniel Road East, Fairfield, NJ 07006 has come out with a centrifugal air sampler which could be used in food processing plants to estimate the number of microbial colony forming units in the air. The biotext RCS is a hand-held instrument which operates on four standard D cell batteries. Test sampling times are switch controlled and ran from 30 sec to 8 min, offering an air capacity of 20-320 L at a separation volumeof 40L/min. Sampled air volume is electronically controlled to an accuracy of ± 2.0%

Food Technology 38(8), 1984, 88

73 Multipurpose extraction system

Tecator of Sweden have introduced a new laboratory instrument, the Soxtec HT2, for the rapid extraction of solid and semisolid materials with different solvents in many applications including food and chemicals. The Soxtec HT2 comprises an extraction unit and service unit. The extraction unit has been designed for the individual operation of two samples and handles small or large sample volumes. The extraction technique used is typically 5 times as fast as the Soxhlet method and recovers about 65% of the solvent. The service unit provides the necessary heat

in the extraction unit ensuring optimum safety for the operator. Tecator are represented in Australia by Selby Scientific,352 Ferntree Gully Road, Notting Hill, Vic. 3168, from whom further details may be obtained.
Food Technology in Australia 36(8), 1984, 352

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIALS)

74 All-India Crop Estimates, 1983-84

Crop	Area '000 hec.	Production '000 tonnes
Rice	40,990.3	59,768.5
Jowar	16,263.4	11,933.8
Bajra	11,810.2	7,624.3
Maize	5,888.3	7,923.6
Ragi	2,600.8	2,991.4
Small Millets	3,612.5	1,711.8
Wheat	24,395.0	45,147.6
Barley	1,376.0	1,787.3
Gram	7,308.4	4,754.9
Tur	3,175.0	2,440.0
Other Kharif Pulses	7,774.8	2,774.3
Other Rabi Pulses	5,154.0	2,685.4
Groundnut (nuts in shell)	7,640.5	7,284.1
Castorseed	637.1	406.8
Sesamum	2,182.4	618.3
Rapeseed & Mustard	3,892.7	2,565.9
Linseed	1,466.1	440.3
Nigerseed	594.9	175.0
Safflower	799.9	468.8
Pepper (Black)	106.98	23.04
Guarseed	2,704.0	1,024.6
Coriander	409.2	171.3
Sunflower	667.3	271.6
Soyabean	814.2	583.0
Dry chillies	803.4	548.4

Agricultural Situation in India 39(7), 1984, 560 & 39(8), 1984, 667

PRODUCTION (INDUSTRIAL)

75 Sugar production

The total sugar output during the first five months of the season 1984-85 was 42,51,000 tonnes as against 40,34,000 tonnes during the corresponding period last year.

The total closing stock of sugar with the factories as on 28.2.85 was about 38,70,000 tonnes as against 50,14,000 tonnes on the same date last year.

Indian Sugar Mills Association Press Release

EXPORT

76 Exports of principal commodities

Commodities	1982-83 (Value: Rs crores)
Live animals chiefly for food	16.57
Meat and meat preparation	80.57
Fish crustaceans, molluscs and preparation thereof	349.45
Rice	199.50
Cashew kernels	133.97
Vegetables & fruits (other than cashew kernels)	158.80
Sugar and sugar preparations	62.35
Coffee and coffee substitutes	184.20
Tea and mate	367.53
Spices	88.93
Oilcakes	149.35
Tobacco unmanufactured & tobacco refuse	208.54
Oilseeds and oleaginous fruits	19.36

Foreign Trade Bulletin 15(1), 1984, 19

77 Export of processed pepper product

Export of processed pepper products e.g. oleoresin, oil, dehydrated green pepper, powder etc., have also risen substantially during the recent years. The major importing countries are USA, West Germany, U.K. Netherlands and France. The details of exports of these products during 1982-83 are as follows:

	Quantity (Tonnes)	Value (Rs. in lakhs)
Pepper oleoresin	118.19	164.37
Pepper oil	12.91	29.88
Dehy. green pepper	63.52	29.93
Pepper powder	31.40	8.00

Indian Cocoa, Arecanut & Spices Journal 7(3), 1984, 3rd cover page

78 Export price of pepper

Members of the International Pepper Community have fixed a minimum export price of 90 cents per 1b. C and F New York for pepper at its 12th Session which was held at Bombay recently. The corresponding price in Indian currency would be Rs. 19,500 per ton f.o.b. It was also decided to set up an ad-hoc Committee of representatives of member countries of the Community, which would review the minimum export price of pepper from time to time and recommend suitable changes whenever necessary.

The meeting which was attended by representatives of the four member countries, namely, Malaysia, Indonesia, Brazil and India, as well as representatives of ESCAP and UNDP reviewed the supply and demand position of pepper in the international market and estimated that demand for pepper during 1984-85 would be about 130,000 tonnes. It was also estimated that only about 108,000 tonnes of pepper would be available

for export from the four member countries, Madagascar and Sri Lanka. This position which projected an excess of demand over supply by about 22,000 tonnes indicated that international prices of pepper would continue to remain at the prevailing high level.

Members of the International Pepper Community also emphasised the urgent need to adopt a common sales contract form. This would enable members to export pepper to different countries without having to succumb to clauses imposed by the various buyers which were detrimental to their own interests.

At the meeting, India approved the implementation of an FAO and UNDP joint project within the country to combat Footrot disease which destroys the pepper crop

Members of the Pepper Community control about 95 percent of the world production of pepper. Representatives of Sri Lanka and Thailand also attended the meeting as observers.

Economic and Commercial News 14(46), 1984, 8

79 Licensing of CTC tea exports

Fresh licences for export of CTC tea will not be issued in the near future so that the domestic requirement for CTC tea is fully met at reasonable prices. The Union Ministry of Commerce has decided that export licences for CTC will be given only after it is ensured that the domestic market has an adequate supply of CTC tea and that domestic prices would continue to be stable through the lean season as well (January-March). Taking effective steps to ensure that tea remains available at reasonable rates to the domestic consumer, the Ministry has taken a view that even though domestic demand for orthodox tea as compared to CTC is low and availability is better, exports of even this variety will be subjected to careful regulation until the present international tea situation of buoyancy in exports persists.

India achieved an all-time record in tea production estimated at 630 million kgs. in 1984 as against 589 million kgs in 1983 and 565 million

kgs in 1982. Under normal circumstances, this would lead to a very comfortable supply position to meet the domestic demand estimated at about 400 million kgs, in 1984 after supplying 215 million kgs, to the export market. However, there has been an international tea shortage which has led to a heavy export demand. The export commitments till the end of September 1984 exceeded last year's exports for the corresponding period by 50 million kgs. If unrestricted exports are allowed, the quantity, exported would be much in excess of 215 million kgs, leading to shortage in the domestic market.

It has, therefore, been decided to restrict exports to 215 million kgs as compared to 209 million kgs, last year. The restrictions are being implemented by carefully regulating the issue of export licences. In arriving at the varietal mix of tea, i.e. orthodox and CTC, to be allowed for export the fact that more than 70 percent of exports in the past have been of the orthodox variety, has been taken into account.

CTC tea is more popular at home and, therefore, issue of export licences for this variety can only be for the surplus quantity available after fully meeting the domestic requirements.

Economic and Commercial News 14(48), 1984, 7-8

80 Exemption of 100 percent export-oriented units from custom duty

Under the hundred percent export oriented unit scheme, various goods including capital goods, raw materials, components, spares etc, are allowed to be imported free of customs duty provided the finished products is exported out of India.

Of the two free trade zones for 100 percent exports that are presently functioning in the country, the Kandla Free Trade Zone (KAFTZ) was set up in 1965 and the Satacruz Electronics Export Processing Zone (SEEPZ) in 1973. At the end of 1983-84 there were 98 and 51 units functioning in KAFTZ and SEEPZ respectively. Besides, the preparatory

works connected with the establishment of four new export processing zones at FALTA (West Bengal), Madras (Tamil Nadu), NOIDA (Uttar Pradesh) and Cochin (Kerala) are in progress. The total cost on the establishment of each EPZ has been estimated at Rs. 100 million.
Economic and Commercial News 14(46), 1984, 5

IMPORT

81 Japan trims import duties on farm and fishery products

The much awaited package of new market opening measures mainly aimed at facilitating increasing imports from developing countries, was announced here yesterday. It includes reductions of import duties on 39 agricultural and fishery products two years ahead of the schedule agreed upon during the Tokyo round of multilateral trade negotiations. However, it is bound to disappoint developing countries for its failure to meet some of their demands for easier access to the Japanese market.

Included are such fishery products as frozen prawns and shrimps of which India is a big supplier but the margin of reduction of import duties is very small. The existing tariff on frozen shrimps and prawns was rather low at 3.4 per cent and this will be now reduced to three per cent.
The Hindu 16 Dec 1984

82 Free import of ethyl alcohol

The Centre has decided to allow import of denatured ethyl alcohol free of customs duty up to November 30, 1985.

According to official sources this step has been taken in view of the shortage of industrial alcohol. Though alcohol production has been increasing, the proportion for industrial purposes was declining.

In 1976-77, industrial alcohol accounted for 60 per cent of total alcohol output but in 1983-84 it had dropped to 46 per cent. It meant the share used for potable purposes had risen from 38 per cent to 54 per cent. This was in spite of a bar on creation of additional potable alcohol capacity in force since 1975.

This year alcohol output is expected to be 600 million litres whereas the demand projection for all purposes is put at 800 million litres. The centre feels the demand projection is on the high side and needs to be reviewed by State Governments.
The Hindu 19 March 1985, 9

83 Indian consumer spends Rs. 20 on tea

Although tea in India is now everybody's drink, its per capita annual consumption in the country is only half a kilogram (0.5 kg)

According to tea industry sources, a recent survey has revealed that an Indian consumer spends on an average Rs. 20 per annum on tea at its prevailing retail price of Rs. 40 per kg, inclusive of 12 per cent local sales tax. Even this small amount spent by him comprises 25 per cent as cost of tea and other ingredients.
Deccan Herald 30 January 1985, 10

84 Rise in per capita income

The total national income has increased from Rs. 50,437 crores to Rs. 54,276 crores in 1983-84, at constant prices (1970-71 base) registering a 7.6 per cent growth in real terms.

According to quick estimates released by the Central Statistical Organisation, the national income at current prices works out to Rs. 1,59,598 crores as compared to Rs. 1,32,470 crores in the previous year, representing a 20.5 per cent increase.

The per capita income in real terms, rose by 5.2 per cent, to Rs. 749 for 1983-84 from Rs. 711 in 1982-83. The per capita income at current prices works out to Rs. 2,201 as against Rs. 1,868 during the previous year.

Consumption expenditure: The private final consumption expenditure at current prices works out to Rs. 1,33,694 crores in 1983-84, forming 68.3 per cent of the Gross Domestic Product at market prices. The per capita final consumption expenditure at current prices is placed at Rs. 1,844 in 1983-84 as against Rs. 1,557 in 1982-83.

In real terms, (i.e. at 1970-71 prices) the per capita final consumption expenditure is estimated at Rs. 640 in 1983-84 and 604 in 1982-83, representing an increase of 5.9 per cent.

Interestingly, the share of the expenditure on food in the total private consumption over the years has shown a decline. On the other hand, there has been a considerable increase in the share of transport and communications, and some increase in the share of clothing and durable household goods. In 1983-84, however, this trend was slightly reversed following a record production of foodgrains.

Savings: The net domestic savings totalled Rs. 31,031 crores in 1983-84 as against Rs. 26,080 crores in 1982-83, thereby constituting 17 per cent of the net domestic product at market price compared to 17.1 per cent in the previous year.

The saving of the household sector went up from 19,848 crores in 1982-83 to Rs. 25,876 crores in 1983-84 with the financial savings during the period increasing by 24.5 per cent from Rs. 11,450 crores to Rs. 14,256 crores and the household physical assets by 38.4 per cent to Rs. 11,620 crores

The savings of the private corporate sector shows a marginal fall from Rs. 1,303 crores in 1982-83 to Rs. 1,255 crores in 1983-84. There is a substantial fall in the public sector savings, from Rs. 4,929 crores to Rs. 3,900 crores mainly due to the fall in the savings of the administrative departments of the Government.

The Hindu 24 January 1985, 1

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

85 Prevention of Food Adulteration (Amendment) Rule 1984

Ministry of Health and Family Welfare (Department of Health)
New Delhi, the 26th September 1984

Notification

G.S.R. 684(E) - Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955, were published as required by Sub-section (1) of section 23 of the Prevention of Food Adulteration Act 1954 (37 of 1954) under the notification of the Government of India in the Ministry of Health and Family Welfare (Department of Health) No. G.S.R. 1190, dated the 3rd November, 1980 at page 2391-2393 in the Gazette of India, Part II, Section 3, Sub-section (i) dated the 15th November, 1980 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of 90 days from the date on which the said notification is published in Official Gazette;

And whereas, it is considered desirable to republish the said draft rules for information of all persons likely to be affected thereby;

Now, therefore, the following draft rules further to amend the prevention of Food Adulteration Rules, 1955, which the Central Government proposes to make after consultation with the Central Committee for Food Standards in exercise of the powers conferred by sub-section of section 23 of the said Act is hereby published as required by the said sub-section for information of all persons likely to be affected thereby and notice is hereby given that the said draft rules will be taken into consideration after the expiry of ninety days from the date on which copies of the Gazette in which this notification is published are made available to the public.

Any objection or suggestion, which may be received from any person with respect to said draft rules before the expiry of the aforesaid period will be considered by the Central Government.

Objections or suggestions, if any, may be addressed to the Secretary Ministry of Health and Family Welfare, Nirman Bhawan, New Delhi 110 011

DRAFT RULES

1. (1) The rules may be called the Prevention of Food Adulteration (Amendment) Rules, 1984.

(2) They shall come into force on the date of their final publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955 (i) in rule 29, in clause (e), the word "Confectionary" shall be omitted;

(ii) in rule 49 after sub-rule (15), the following sub-rules shall be, inserted, namely:

"(16) No person shall sell mineral oil (food grade) for use in confectionery except under Indian Standards Institute Certification Mark.

(17) No person shall sell confectionery except in wrapped condition

Explanation:- For the purposes of sub rules (16) and (17) "confectionery" shall mean sugar boiled confectionery and lozenges",

(iii) in Appendix 'B' for items A 25, A 25.01, A 25.02 and A. 25.03, the following items shall be substituted namely:

"A.25 CONFECTIONERY

A.25.01 - Sugar boiled confectionery whether sold as hard boiled sugar confectionery or pan goods confectionery or toffee or milk toffee or modified toffee or lacto-bon-bon or by any other name shall mean a processed composite food article made from sugar, with or without doctoring agents, such as liquid glucose, cream of tartar, either by boiling or by process of panning or both. It may contain centre filing which may be in the form of liquid semi-solid or solids with or without coating of sugar or chocolate or both. It may also contain any of the following:

(i) sweetening agents such as sugar, invert sugar, jaggery, lactose, gur, bura sugar, khandsari, sorbitol, honey;

(ii) milk and milk products;

(iii) edible molasses;

(iv) malt extracts;

(v) edible starches;

(vi) edible oils and fats;

(vii) edible common salt;

(viii) fruit and fruit products and nut and nut products;
(ix) tea, coffee, chocolate, cocoa;
(x) vitamins and minerals;
(xi) shellac (food grade) not exceeding 0.4 per cent by wt. bees wax (food grade), paraffin wax (food graee), carnauba wax (food grade), and other food grade wax or any combination thereof;
(xii) edible desiccated coconut;
(xiii) spices and condiments and their extracts;
(xiv) candid peel;
(xv) enzymes;
(xvi) glycerine (food grade);
(xvii) sodium bicarbonate;
(xviii) Lubricants such as calcium, magnesium or sodium salts of stearic acid, talc (not exceeding 0.2 per cent), icing sugar or liquid paraffins (food grade) (known as mineral oil);
(xix) permitted anti-oxidants;
(xx) gelatine (food grade);
(xxi) permitted stabilizing and emulsifying agents;
(xxii) permitted flavouring agents;
(xxiii) acidulants, such as citric acid, tartaric acid, malic acid, (food grade);
(xxiv) jellifying agent;
(xxv) permitted preservatives;
(xxvi) edible foodgrains;
(xxvii) calcium bicarbonate, calcium carbonate
(xxviii) baking powder,
(xxix) gulkand, gulbanafsha, mulathi;
(xxx) puffed rice;
(xxxi) chinagrass;
(xxxii) eucalyptus oil, camphor, menthol oil crystals, pepper mint oil;

It shall not contain artifical sweetners and coaltar food colour.

Mineral oil (foodgrade) if used as a lubricant, shall not exceed the limit of 0.2 per cent by weight. It shall also conform to the following standards namely:

(i) Ash sulphated - Not more than 2.5 per cent (on salt free basis) by weight:

Provided that in case of sugar boiled confectionery wherein spices are used as centre filling the ash sulphated shall not be more than 3 per cent by weight;

(ii) Ash insoluble - Not more than 0.2 per cent in dilute hydrochloric acid by weight: acid.

Provided that in case of sugar boiled confectionery where spices are used as centre filling the ash insoluble in dilute hydrochloric acid shall not be more than 0.5 per cent.

Where the sugar boiled confectionery is sold under the name of milk toffee and butter toffee, it shall conform to the following additional requirements as shown against each:-

(1) Milk toffee

(i) total protein (NX6.25) shall not be less than 3 per cent by weight on dry basis;

(ii) at content shall not be less than 4 per cent by weight on dry basis.

(2) Butter toffee-- fat content shall not be less than 4 per cent by weight on dry basis.

It may contain sulphur dioxide in concentration not exceeding 350 parts per million.

A.25.2 lozenges: Lozenges shall mean confections made mainly out of pulverised, sugar, or icing sugar with binding materials such as edible gums, edible gelatine, liquid glucose or dextrin and generally made from cold mixing which does not require primary boiling or cooking of the ingredients. It may contain any of the following:-

(i) sweetening agents such as dextrose, dextrose-mono hydrate, honey, glucose, invert sugar, sugar, jaggery, bura sugar, khandsari, sorbitol;

(ii) milk and milk products;

(iii) nuts and nuts products;

(iv) malt syrup;

(v) edible starches;

(vi) edible common salt;

(vii) ginger powder or extracts;

(viii) cinnamon powder or extracts;

(ix) aniseed powder or extracts;

(x) caraway powder or extracts;

(xi) cardamom powder or extracts;

(xii) cocoa powder or extracts;

(xiii) proteins;

(xiv) coffee extracts or its flavour;

(xv) permitted flavouring agents;

(xvi) acidulants such as tartaric acid, malic acid and citric acid (food grade)

(xvii) permitted emulsifying and stabilising agents;

(xviii) vitamins and minerals;

(xix) sodium bi-carbonate;

(xx) Lubricants such as calcium, magnesium or sodium salts of stearic acid, talc (not exceeding 0.2 per cent) It shall not contain artifical sweetners and permitted coaltar food colour.

Mineral oil (Food grade), if used as lubricant shall not exceed the limit of 0.2 per cent by weight

It shall also confront to the following standards:-

(i) Sucrose content--Not less than 85.0 per cent by weight

(ii) Ash sulphated (Salt--Not more than 3.0% free basis) by weight

(iii) Ash insoluble in--Not more than 0.2% dilute (hydrochloric acid by weight

It may contain sulphur dioxide in concentration not exceeding 350 parts per million.

(No. P-15014/2/84-PH(F&N)PFA)

S.V. SUBRAMANIYA, Jt. Secy.

The Gazette of India Part II, Section 3, Sub-section (i) No: 378, 1984

86 Vegetable oil production (second amendment) Order 1984
Ministry of Food & Civil Supplies (Deptt. of Civil Supplies) Order
New Delhi, the 20th September, 1984

G.S.R. 675 (E) -- In exercise of the powers conferred by sub-clause (1) of clause 4 of the Vegetable Oil Products Control Order, 1947, the Vegetable Oil Products Controller for India hereby makes the following Order further to amend the Vegetable Oil Products (Standards of Quality) Order, 1975, namely:-

1. (1) This Order may be called the Vegetable Oil Products (Standards of Quality) (Second Amendment) Order, 1984
   (2) It shall come into force at once.
2. In the Vegetable Oil Products (Standards of Quality) Order, 1975, in the First Schedule, after clause 6A, the following proviso shall be inserted, namely:-

"Provided that where, for any special reason, any person finds it necessary to manufacture, stock or sell any vegetable oil other than those specified in clause 2(1)(a), such manufacture may be undertaken or such stock may be kept or such sale may be made by him after obtaining prior permission therefor from the Vegetable Oil Products Controller for India, and such vegetable oil shall be manufactured,stocked or sold by him in accordance with the instructions of the said Controller"

(No. 9VP(1)/82)
S.V.M.TRIPATHI,
Vegetable Oil Products Controller for India

The Gazette of India Part II, Section 3, Sub-section (i) No: 372, 1984

87 Low fat content in Indian diet

Recent studies at the National Institute of Nutrition (NIN), Hyderabad, reveal that on an average Indian diet fats contribute eight to ten per cent of total energy at a level of 14 to 20 grams per capita daily intake.

Against this, fats in the diets of developed countries yield

30 to 40 per cent of total energy, with daily per capita intake ranging from 70 grams to 150 grams.

Another big difference is that animal fats predominate the diets of people living in developed countries.

The Times! 26 March 1985, 2

88 Lactic acid and calcium lactate are GRAS

FDA has affirmed that lactic acid and calcium lactate are GRAS. Details are in the Federal Register of Sept. 7 for more information, contact L.C. Gosule at FDA, 200 C St., S.W., Washington, DC 20204

Food Technology 38(11), 1984, 31

89 Permits acids in meat and poultry

USDA's Food Safety and Inspection Service is permitting the use of acetic, citric, lactic, phosphoric, and tartaric acids, as acidifiers in processed meat and poultry products. Details are in the Federal Register of Sept. 12. For more information, contact D. Jones at USDA/FSIS, Washington, DC 20250

Food Technology 38(11), 1984, 32

90 Okays acrylonitrile styrene copolymers for beverage bottles

FDA is allowing the use of acrylonitrile/Styrene copolymers to fabricate beverage containers, in response to a petition filed by Monsanto Co. Process improvements have lowered the residual acrylonitrile monomer to less than 0.1 ppm in the finished bottle. Although acrylonitrile monomor has been shown to be carcinogenic. FDA has used risk assessment procedures to conclude that at this level there is a reasonable certainty of no harm from exposure to acrylonitrile from the use of these bottles. Details are in the Federal Register of Sept. 19, For more information, contact T.C. Troxell at FDA, 200 C St., S.W. Washington DC 20204

Food Technology 38(11), 1984, 31

QUALITY CONTROL

91 Quality guide for shrimp processors

A training kit for shrimp processors trying to get top quality products can now be obtained from FAO's Infofish service in Kuala Lumpur.

The regional Infofish training course on shrimp/fish quality control held in Penang, Malaysia, last year, paved the way for preparation of a training kit to assist in planning, organising and conducting quality control training at national or factory levels.

From this, the service has been working on a kit which could be adapted to various fish products, techniques, levels of sophistication and geographical areas.

"This kit," says Infofish, "is intended as a tool to facilitate the work of the organisers and lecturers."

The aim is to provide a two-part kit. The first general part can be applied to any product or technology. The second part relates to a particular species.

In the first provisional kit, Infofish is concentrating on the needs of the export oriented processing industry in its member countries in Asia. It comes in two parts with the second section dealing with tropical shrimp. Each part consists of a textual portion and a set of 50 colour slides.

Topics covered in the 35 page first section include fish as food and should be handled as such, why fish spoils, how to prevent spoilage, how to access quality, how to organise an in-plant quality control programme and sanitation.

The 57 page second part begins with a look at the raw material and goes on to cover such aspects as handling and processing methods, products, product specifications, and descriptions and determination of shrimp defects.

Further information about the training kit can be obtained from Infofish, P.O. Box 10999, Kuala Lumpur 01-02, Malaysia

Fishing News International 23(10), 1984, 25

92 Method to detect khesari dal in pulses

The Indian Standards Institutions (ISI) New Delhi has developed a method for quick detection of khesari dal in pulses.

For determining its presence, 50 ml of dilute hydrochloric acid should be added to the dal and kept on simmering water for about 15 minutes. If a pink colour develops, it, indicates the presence of khesari dal which is considered as a toxic material.

It is expected that the methods would help the farmers in assessing the quality of their product and also help in fixation of their price on a scientific basis.

PTI Science Service 4(4), 1985, 17

HYGIENE

93 Some Vegetables contain goitrogenic substances

Three of Delhi's commonly used vegetables--cabbages, lady's fingers and turnips-- contain substances which cause goitre, researches conducted the the Institute of Nuclear Medicine and Allied Sciences, New Delhi, (InMAS) a Defence R & D Organisation, have revealed.

The studies found that presence of goitrogenic substances-thiouracil and thiocyanate in the vegetables.

Thiouracil exhibits antithyroid activity by inhibiting organic binding of iodine and the thiocyanate inhibits trapping of iodine by thyroid gland.

Goitrogenic potency of the vegetables was studied in rats. Adult male rats were fed for over 26 days separately on thiouracil and thiocyanate and extracts of carrots, cabbages, turnips and lady's finger procured from Delhi's markets.

He said the cabbages, turnips and lady's finger showed high thiocy-aate and thiouracil contents while the carrots did not. The study provided a new approach to the problem of goitre, he said.

Till recently it was generally believed that endemic goitre results from a deficiency of iodine in the external environment. Though iodine

deficiency was well established as an 'etiological factor', it was not the sole cause, Sarkar said.

He said neither dietary iodine deficiency always results in endemic goitrie nor iodine supplementation completely eradicates and prevents goitre development in parts of the world.

There was convincing evidence that other environmental factors acted in conjunction with iodine deficiency in the development of goitre. One such environmental factor is 'goitrogen' in food, Sarkar added.

PTI Science Service 4(3), 1985, 14

94 Foam cleaner copes with fats and proteins

Diversey NZ Ltd has introduced a new all-purpose cleaner for the food processing industry.

The product, Tri-Foam, lends itself particularly to the meat industry. Tri' signifying a 3 in 1 heavy duty liquid alkaline cleaner - (one) it is high foaming (two) it is highly chlorinated, and (three) it is inhibited to provide soft metal protection.

Claimed to be an excellent 'all in one' product to remove fats and proteins from all surfaces, Tri-Foam was designed especially for use as a general equipment cleaner. It can be used with foam equipment, manually or in high pressure cleaning equipment.

The distributors are offering free demonstrations.

Diversey NZ Ltd,
23-172, Auckland.

Food Technology in New Zealand 19(8), 1984, 55

95 Meat-eaters on their way out

Vegetarianism is coming into vogue and health food shops say sales are booming. Holland and Barrett, the country's biggest health food chain, reported a 30 per cent jump in vegetarian sales in 1984.

Ms Jill Slann, the Cahin's buying and development manager said: "It's a revolution in eating habits" and attributed the growing popularity of meatless eating to concern for health and the controversy over chemicals in food, the ethical debate over cruelty to animals and factory farming

famine in the Third World and finally the cost.

Health foods are no longer restricted to a few specialist shops. The big stores have decided this is too lucrative a market to miss. In fact, one leading group, British Home Stores, transformed its grocery shelves, displaying lentils, kidney beans, raw brown sugars, dried fruits and stone-ground wholewheat flour.

Britain's Vegetarian Society, established in 1847, is jubilant, its press officer Mr. Philip Brown said: Vegetarianism certainly has leapt in the last couple of years. "A Gallup survey put the number of Britons avoiding meat at 1.1 million and the figure was growing all the time.

The society is unblushing in its forthright attacks on meat. In a recent statement on the display of slaughtered animals, it said: "Fat, off-colours, ooze, drip, slime, smell and sex-taints are among the difficulties challenging the carcass mongers." The meat industry has become increasingly concerned about its public image. Mr. Starbrook, in an editorial called on butchers and porters to abandon their blood-stained white smocks and wear something less likely to frighten the faint-hearted shopper. He also suggested a change of terminology, scrapping words like "butcher" and "slaughter house" in favour of "victuallers" and "meat plant".

The trade is also launching a major promotion campaign to reverse a trend away from red meat. According to Government figures, consumption of beef and veal per head has fallen from 22.5 kg in 1979 to 18.2 kg in 1983. *The Hindu 17 February 1985, 4*

96 Plea to stop eating frog legs

The World Wildlife Fund (WWF) chapters in West Germany and Switzerland have called upon the food and hotel industries in their country to stop serving frog legs to avoid an ecological catastrophy in India, Bangladesh and other Asian nations.

A report by Ms. Elizabeth Kemf for the Funds International set-up indicates that Bangladesh alone sends over 500,000 kg of frog legs to West Germany, every year, representing 12 million frogs. This year, over 200 million frogs, all of which are taken from the wild, are expected to be imported from the Asian countries.

According to WWF-Germany, more than 150 million frogs are exported from India and Bangladesh to Europe, Australia and the United States. Indonesia is another major exporter of frog legs.

The Hindu 24 January 1985, 9

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

NIL

PERSONALIA

NIL

RAW MATERIALS

97. A high papain-yielding papaya

A new papaya selection from Washington type (CP 15) was isolated for its high papain production and released as CO. 5 at the Faculty of Horticulture, Tamil Nadu Agricultural University, Coimbatore.

It is a dioecious type with medium tall habit (flowers at 90 cm height) having characteristic deep purple pigmentation on the stem, petiole, petals, stamens and fruit stalk. The size, weight and surface area of the fruit are larger than CO. 2 which is at present a ruling variety for papain (4-5 gm dry papain)/fruit.

CO. 5 papaya is exclusively suitable for papain production. It has recorded consistently in the last four seasons 14-15 gm of dry papain/fruit. This is really a breakthrough in papaya research and the world's highest record in papain production. The previous record in the world was 3-4 gm of dry papain/fruit. The tree yields 75-80 fruits/2 years/weighing 2 to 2.5 kg/with an yield of 500 tons of fruit/ha and 1500-1600 kg of dry papain/ha. The cost benefit ratio is 1:3.3.
The Hindu 3 July 1985, 20

STORAGE AND INFESTATION CONTROL

98. Preserving onion and mushrooms

Scientists in Delhi have demonstrated that onions and mushrooms can be preserved for 10 to 15 days by applying a combination of radiation and chemical treatment.

It is also possible to delay the ripening of tomatoes and mangoes without their getting decayed for varying periods using the same method.

The major advantage of the method is that it reduces the hazards of both chemicals and radiation as it requires only small doses of both.

The IARI scientists, who had been studying the microbial spoilage of the vegetables and fruits found that in the case of mushrooms, the method could reduce the damage to 20 to 30% from normal decay of 50 to 60%.

Using a radiation dose of 25 kilorads and a fungicide rate of 0.75 g/kg of the material, it was possible to extend the storage life and delay the sprouting of onions.
PFNDAI Newsletter No. 14, April 1985, 1

94 Ultrasonic pest control

An improved, lowcost ultrasonic pest control unit sends forth ultrasonic sound to disturb the nerve cells of rodents and roaches and eliminate them within 30 days of continuous operation.

It is the development of Thailand Institute of Scientific and Technological Research, 196, Phahonyothin Road, Bang Khen, Bangkok, 9, Thailand.
Invention Intelligence 20(2), 1985, 50

FOOD ADDITIVES

Nil.

PROCESSES

100. New polysachharide by fermentation

A polysachharide to rival gum arabic can now be produced by fermentation, according to IGI Biotechnology, a Columbia, Maryland-based firm. The company is test marketing small quantities of the product, dubbed, PolyLevulan produced on the pilot scale.

The polysachharide product-a homopolymer of D-fructose-is secreted by a mutated Zymomonas mobilis bacterium. The fermented product is subjected to ultrafiltration and centrifugation to yield a spray-dried powder. IGI claims that the biopolymer has similar stability, viscosity and solubility to gum arabic.

Traditionally obtained from Acacia senegal and related plant exudates, gum arabic is a complex, highly branched polysachharide used as an emulsifier, stabilizer and binding agent with applications in the production of pharmaceuticals, adhesives, inks, textile prints, cosmetics and food.
PTI Science Service 4(10), 1985, 18

101. Commercial exploitation of bran stabilizer

National Research Development Corporation, New Delhi has taken up the continuous rice bran stabilizer developed by the Centre for purpose of popularization and commercial exploitation in India. In this connection two representatives ofthe corporation visited the centre to discuss the various issues involved in the programme.

The bran stabilizer developed works on the basis of conduction heating. It consists of two drums, one for steaming the bran, and the other for drying it. Its operation is continuous; it has a capacity of 30 kg. per hour sufficient to match the capacity of one tonne per hour rice mill. Stabilizers with larger capacities and of similar type can be easily designed. Its performance test indicates that the stabilized bran can be stored for 60 days at a temperature of 30 C and at a relative humidity of 75 percent with FFA (Free Fatty Acid) level not exceeding 8 percent. The stabilizer can be fabricated locally at an approximate cost of Rs.8000/- each. Easy to operate, it can be installed very easily in a rice mill.
Rice Milling 1(12), 1984, 4

102. Pulse punching - a way to reduce cooking time

A novel idea was tried to reduce the time of cooking of dried pulses. It comprises of punching the green re-wetted pulses and drying. The punched grains not only dried faster but the cooking time of dried punched grain pulses also reduced drastically. To facilitate the operation of punching, a manual pulse punching machine was developed.

The machine mainly consists of three plates, a lever handle and a base frame. The top plate has nickle coated needle welded to it. The plate always remain floating due to four springs in upper position. When it is pressed down with lever handle the needle go down through the holes of middle plate down to the down plate . The plate acts as container for placement of peas in single layer. The needles when come to the down plate they pierce through pea grains. When the lever handle is released, top plate along with needles move up due to spring. The middle plate acts as barrier to peas due to which these are left back in down plate . This way a batch of peas (roughly 250 g) gets punched in one batch. Similiar type of punching experiments were done on other pulses also.

The capacity of punching machine varies m 7.5 to 15 kg per hour depending upon the pulse. In single punch the grain punching percentage has varied in between 95 and 95.6 per cent. The cooking time has reduced with increase in number of punches. The cooking time has been reduced by 7.3 - 18.5% with single punch and 21.7 to 60.0% with three punches. This machine is easy to fabricate, low in cost and is easy to operate.
Changing villages 7(2), 1985, 65-72

BYPRODUCTS AND WASTE UTILISATION

Nil.

PROCESSED PRODUCTS

Nil.

EQUIPMENT AND MACHINERY

103. Low cost hand maize-sheller

Maize is a very important crop of India and is grown throughout the year. The total maize cropped area is about 5.87 million hectares yielding about 6.33 million tonnes of maize per year.

A small, simple, pipe type hand maize-sheller has now been designed with a view to increase the shelling efficiency. Its cost works out to only Rs.5.

It has been observed that shelling of maize with the help of the new maize-sheller is about 2.5 times more than shelling by hand rubbing.

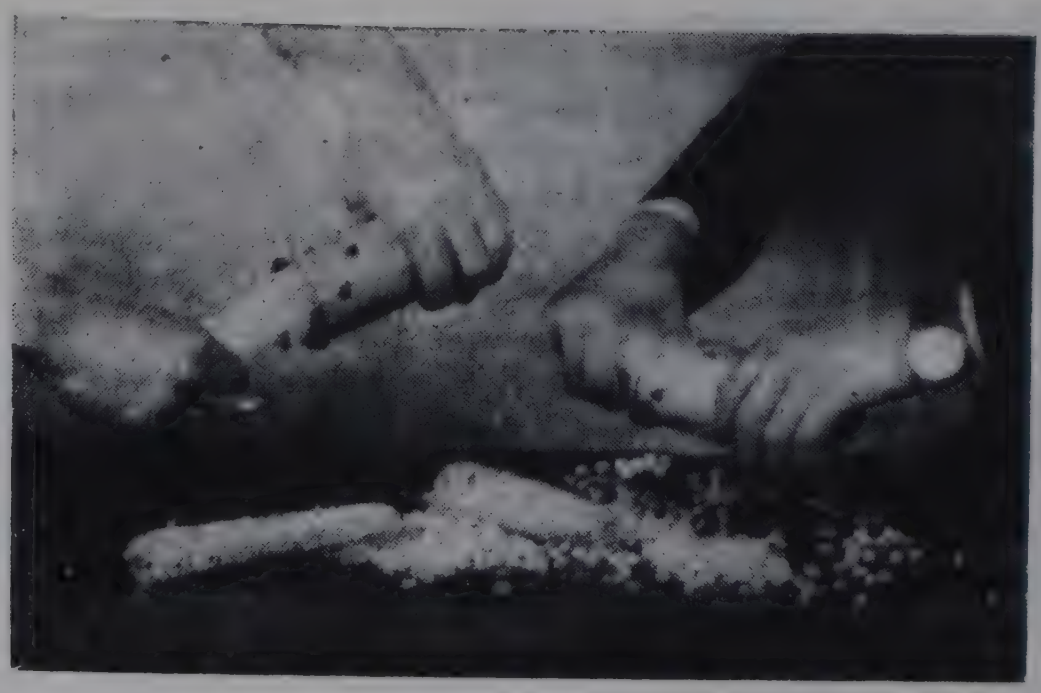
The hand maize-sheller is made of 20-guage GI sheet of 200 mm x 140 mm size, folded into a cylindrical shape of 60 mm diameter and 140 mm length. The joining ends are fixed together with the help of two rivets. Four rows of V-shaped notches with four notches in each row are cut at both the ends of the pipe making a subsequent pair. These notches are inverted inside the pipe at an angle of 90 C. The lengths of the notches are 12.50 mm, 15.00 mm, 17.00 mm and 19.00 mm for the first second, fourth and third rows, respectively. The variation in the length of the notches makes the device suitable for various sizes of cobs.

For shelling maize by this maize-sheller the cob is first firmly inserted into one end of the pipe. The maize-sheller is now rotated half a circle with one hand and the cob in the opposite direction with the other hand, and then back to the original position.

The same process is repeated till all the kernels are set free from the stone. Only a little force should be applied to insert the cob inside the maize-sheller. First about two-third of the cob length should be shelled, then it should be reversed and the process repeated to shell the remaining portion.

The test results reveal that this maize sheller can give an output of 15 kg of shelled corn per hour against only 6 kg of corn obtained by hand shelling.

Maize-sheller in operation.



The best performance of the maize-sheller was observed at 14% moisture content of the kernel. The kernel damage was also found to be negligible, ranging from 0.2% to 0.5%, at this moisture content..

Invention Intelligence 19(7-8), 1984, 320-2

104. Machine removes foodgrain impurities

The Dry De-Stoner Model SK-D-10 is for the separation of stones, mud particles, glass and iron pieces and other heavy impurities from food grains, pulses, oilseeds and spices. The machine works on the principle of difference in the specific gravity of the stocks to be cleaned and the specific gravity of the impurities. The cleaned material becomes air-borne and travels downwards, while the impurities, on account of oscillating motion of the deck, travel in the opposite direction i.e., upwards. The fan electric motor and starter are fixed in the machine body. Adjustment of air, inclination and oscillating action can be done while the machine is working. The machine features pillow block bearings and all-steel construction. It is available in capacities of 0.5, 1 and 2 tonnes/hour. For further information write to: S.K. Engineering and Allied Works, Sheonagar, Bahraich, Uttar Pradesh 271 801

Industrial Products Finder 13(4), 1985, 158

105. Multi-crop cleaner-cum-grader

The machine, is suitable for cleaning and grading cereals and pulses at village level.

Construction: The prototype machine consists of replaceable rotary and vibratory screens, an aspirator, and a controlled hopper. All these parts are mounted on a 2"X 2" X 1/4" angle-iron frame supported on four cast-iron wheels. The machine requires a 2 hp single phase electric motor for operation.

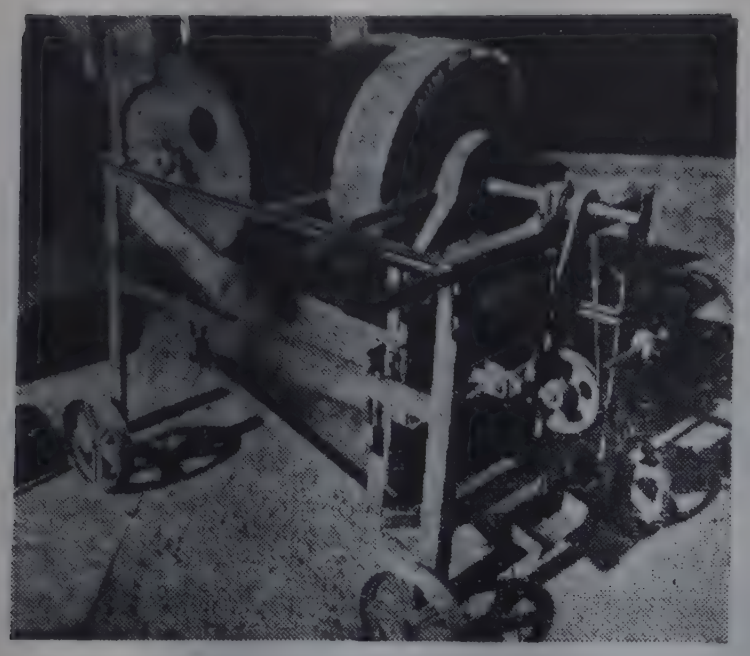


Fig.1.The prototype multi-crop cleaner-cum-grader.

Table showing the performance of multi crop cleaner-cum-grader

	Cleaning	Grading
Capicity(100 kg)	30	18
Efficiency(%)	98	92
Energy consumption (kwh/tonne)	0.33	0.55

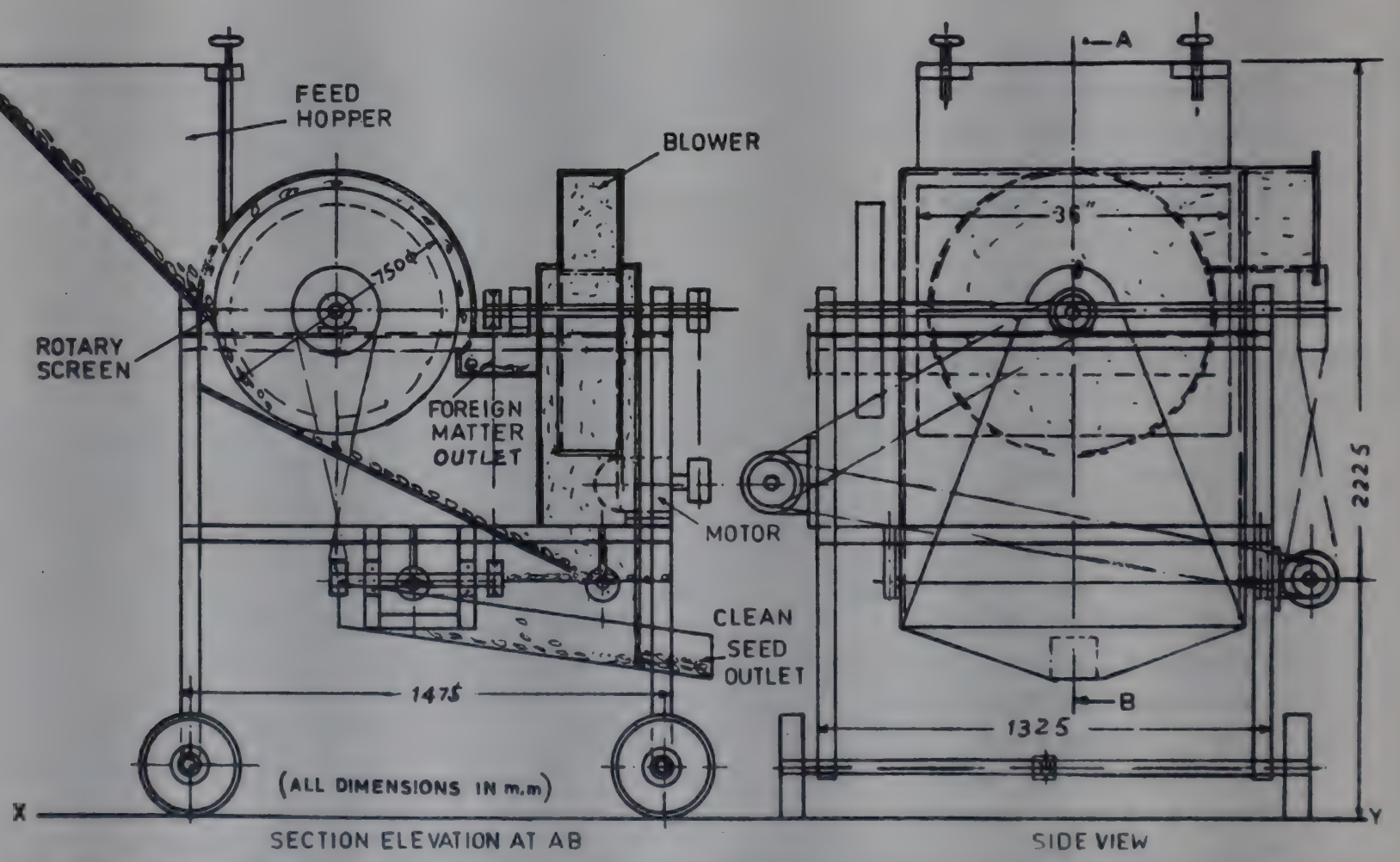


Fig. 2. The constructional details of the multi-crop cleaner-cum-grader.

The constructional details of the multi-crop cleaner-cum-grader are shown in Fig.2.

Operation: The feed from the hopper comes in contact with the perforated rotary screen dueto gravity. The grains along with the undersize impurities pass through this screen whereas the oversize impurities travel over it and get separated. As the grains and the undersize impurities fall from the bottom of the screen on to the MS platform, the lighter material is lifted up and separated by an air blast. The heavier, small and large size impurities get separated on the lower screen.

The upper screen has larger perforations than the lower screen. These two screens also carryout the grading of the

produce by separating small grains from the sound ones.

Performance: The machine was tested on wheat. The capacity, efficiency and energy requirement were studied. The results are presented in the Table.

The machine was also used for cleaning and grading maize, gram, peas and paddy and it gave satisfactory results.
Invention Intelligence 19(9-10), 1984, 389-390

106. Dehusking the coconut in a jiffy

The mechanized coconut dehusking is here to stay after a number of experiments stretched through years. The JAFFA dehusker is being made commercially by the Jaffa Incorporated Limited, UK, under licence from the British Technology Group. The prototype was developed by Tropical Products Institute (TPI).

The main components of the dehusker are: (a) Geared Motor Unit - 5.5 kW double reduction type gearbox, running on taper roller bearings, producing an output of 50 r.p.m.; (b) Main Drive Unit; and (c) Impaling Unit-a clamping mechanism with two-handed closing operation and endless chains carrying equally spaced impalers. The endless chains carry three impalers driven at 4 r.p.m. An impaler passes the loading position every five seconds, enabling a continuous running with a throughput of 720 nuts per hour.

The construction of the machine is rugged and only a minimum maintenance is required. Diesel engine or mobile generator can be used to power the dehusker. Safety mesh guards both sides and the husk disposal shute is angled to the side of the machine.
PTI Science Service 4(5), 1985, 19

107. Fruit washing/sorting machine

MPE have developed a machine for washing and sorting fruits such as apple, pear, citrus, mango, tomato, etc. Washing is performed in two stages: first, in a trough with turbulence of water through air jets and next under water spray over fruits carried on a conveyor with rotating aluminium rollers. Fruits are sorted for quality and bad ones are dumped on to a belt conveyor for disposal. The washed fruits are conveyed to the next stage of processing. For further information write: Mysore Precision Engineers, C-123/124 Industrial Estate, Yadavagiri, Mysore, Karnataka 570 020
Industrial Products Finder 13(6), 1985, 198

108. Soybean dehusking and grit-making plant

S.K. Engineering and Allied Works offer a soyabean dehusking and grit-manufacturing plant to provide thoroughly clean and completely husk-free grits so that the decilled soya flour becomes fit for human consumption. The processing is completely automatic and independent of weather conditions. Plants are available in capacities ranging from 50 to 250 tonnes, a day. For further information write to: S.K. Engineering and Allied Works, Sheonagar, Bahraich, Uttar Pradesh 271 801

Industrial Products Finder 13(4), 1985, 159

109. Pulse mill

S.K. Engineering and Allied Works have developed, what is claimed to be the latest and modern dal (pulse) mill. The mill provides a completely automatic system of processing which takes place within the work-room. The mill comes in 0.5, 1 and 2 tonne/hour capacities. As no sun-drying is involved the risk of the stock getting wet or damaged by unexpected rain is eliminated. The milling technology features a system of conditioning the pulse by loosening the husk in the first phase so that it (husk) is removed without any pressure or rubbing. This reduces almost completely the chances of the pulse getting powdered thereby increasing substantially the yield of dal, it is said. In the second phase, the dehusked pulse (gota) is again subjected to such a conditioning effect that the splitting (of dal) takes place easily. Air temperatures, relative humidity and stock flow are suitably adjusted by instantaneous controls. The plant is constructed of steel to withstand rigid working conditions. For further information write to: S.K. Engineering and Allied Works, Sheonagar, Bahraich, Uttar Pradesh 271 801

Industrial Products Finder 13(4), 1985, 155

110. Blow dryer-cum-mixer machine

ECI offer a blow dryer-cum-mixer for drying chemicals, pharmaceuticals, dyes, foodstuffs and casein (milk products), etc., The unit can also be used as a mixer without any change. Its inside parts and body are from carbon and stainless steel. It is suitable for batch-type process and comes in models of capacities ranging from 50 to 200 kg. For further information write to: Eltech Control Industries, C 172, GIDC Estate, Mehsana, Gujarat 384 002.

Industrial Products Finder 13(6), 1985, 135

111. Medium duty granulator

The Patma medium range granulator/cutting mill cuts direct extruder prerun and blow moulding waste in hot and plastic conditions, and is available with/without suction system. The granulate may be conveyed direct to the feeding installation or

stored in storage place. The single unit, stable cast iron housing makes for vibration free running. All components are easily accessible, once the cover is opened. A robust 3-fly rotor, working against four square blades, rotates in two heavy duty bearings sealed in cast iron flanged housing. The stainless steel screen insert closes the lower half of the body. Apart from all kinds of plastics and rubbers the machine handles spices, drugs, paper, cardboard, leather, wax, paraffin, etc. For further information write to: Patma Machinery Pvt. Ltd. Plot A-160, Road M, Wagle **Industrial Estate, Thane, Maharashtra 400 604.**
Industrial Products Finder 13(4), 1985, 105

112. Low-cost canning machines

A range of low-cost canning machinery from Britain, intended for cottage industries and laboratory use (where production-speed requirements are normally low), is extremely compact and can handle a wide variety of products.

The range comprises three complementary machines - a bench - mounted flattened-can reformer, a can flanger, and a single-head double-seaming machine. All three could be easily transported in an average estate car.

The reformer and flanger machines can process cans of 50 mm to 175 mm diameter and from 40 to 255 mm in length. They can be supplied for either manual or electropneumatic actuation, and their maximum production speed is 20 cans/min.

The double-seaming machine is supplied with steam-flow, vacuum/gassing, pressure or carbon-dioxide gassing chambers or for atmospheric seaming/closing. Maximum production speed ranges from 6 to 16 cans per minute depending on can size and the treatment of the filled can. It can double-seam metal to metal, metal to composite, or metal to plastics, with the ability to handle container diameters from 50 to 230 mm, and lengths of 40 to 255 mm. Adjustment to process a different diameter takes about ten minutes, and different can height takes just three minutes. For further information please contact: AID and Packaging Services (UK) Ltd, 270 Malvern Road, Worcester, England WR2 4PA

113. Edible oil packaging machine

Piltz Prazisionswerkzeuge GmbH und Co of Fed. Republic of Germany have developed a high speed automatic FFS machine for packaging edible oils and fats in one-kilo and half-kilo pouches of polyester/LDHD laminates of co-extruded films. Features include: four side face-to-face sealed pillow type pouches, infinitely variable sealing pressure upto 2.3 tonnes, print registration on both sides of the pouches, cryogenic seal quenching system to maximise seal strength and integrity, and dosing pumps and time sequencing to cure the seals before

dosing of the product, etc. The machine achieves an output of 2,000 pouches/hour of one kilo pouches. Complete systems with outputs of 6,999 pouches per hour with integrated microprocessor-based checkweighing system and contactles ink jet spray marking/coding system can be supplied. For further information write to: Babri Packagings Pvt Ltd, B46, Naraina Industrial Area, Phase II, New Delhi 110 028
Industrial Products Finder 13(4), 1985, 79

114. Edible oil filling machine

Panchal offer an automatic volumetric filling machine capable of filling foaming and non-foaming liquid products such as edible oils into virtually any shape of container. The machine is pneumatically operated, and is provided with a synchronised conveyor and oil storage tank with float valve of suitable capacity. It has facility of No Tin-No Fill, but in the absence of container, synchronised conveyor would still be in motion until another container comes. Two conveyors, one on each side, can be provided. For further information write to: The Panchal Workshop, Anand Sojitra Road, P.O. Box 62, Anand, Gujarat 388 001
Industrial Products Finder 13(6), 1985, 151

115. Temperature indicator for tea dryer

Hindustan Electronics offer a digital temperature indicator for tea dryer. The instrument can be placed at any place far from the dryer. There is no restriction on the length of the cable connecting the sensor (mounted on the dryer) and the bright red 15.24 cm display can be read from as far as 31 metres. For further information write to: Hindustan Electronics, 1/1 Vansittart Row, Calcutta 700 001
Industrial Products Finder 13(4), 1985, 133

116. Bottle washing machine

Kerry Jost Tools Limited of Madras manufacture a rotary bottle washing machine for distilleries, breweries, beverage manufacturers and pharmaceutical industries. The machine cleans various sizes of bottles by a series of distinct processing operations, at a maximum output of 4,800 bottles per hour over a 1.5 minute cycle time. The output capacity will vary with the washing cycle time. Bottles which are lower than 180 ml in size can also be washed with special bottle holders to suit different sizes of bottles. Washing is by means of powerful water jets in four different sections of varied durations. The washing machine is made with washing area of stainless steel or mild steel, depending upon the application. For further information write to: Kerry Jost Tools Limited, Great Social Building, Sir Phirozeshah Mehta Road, Bombay 400 001
Industrial Products Finder 13(6), 1985, 157

117. Polyethylene tough like metal

Scientist of the Leningrad Institute of High Molecular Compounds and Plastopolymer Research in the USSR have developed a special type of polyethylene which is as strong as metal. The secret of its strength lies in the composition and shape of its molecules. Unlike ordinary polyethylene, its molecules are not folded in knots but stretch out into long chains oriented in one direction. To obtain this quality the melted polymer heated to 200 C is quickly cooled as it goes out of the spinneret.
Invention Intelligence 20(2), 1985, 50

118. Plastic trays for ovens

PET (polyethylene terephthalate) trays can withstand heat up to 220 C and temperature as low as - 40 C. Their chief advantage over other materials is that they are suitable for dual purpose (microwave conventional) reheating of frozen prepared meals. Market testing has already disclosed a dramatic preference for PET over aluminium foil. The first plastic tray for use in both microwave and conventional ovens was developed by Plastone Limited of Britain.
The Hindu 29 May 1985, 19

119. Insulating hood

For use in the food industry, Sattler Textilwerke OHG have come up with an insulating hood consisting of a flexible membrane of laminated design with built-in air chambers ensuring effective insulation of radiated and conducted heat. Placed over a loaded pallet, the hood creates an enclosed space insulated from the surrounding air, and food contained within it remains fresh twice as long as otherwise-without the need for energy, it is said. For further information write to: Settler Textilworks OHG, A 8041 Graz-Thondorf, Austria.
Industrial Products Finder 13(6), 1985, 31

PACKAGING

120. Food Sterilization/Packaging Technique

A new technique for sterilizing and packaging food which makes it possible to maintain good taste and nutritional values even when the food is stored at room temperature has been introduced. The method called 'Multitherm' is designed for solid foods while 'Achilles' is intended for liquid foods. In both cases, sterilization is achieved by heating food in transparent plastic packages with microwaves for a very brief period. Previously, this was impossible since microwaves heat

in an uneven manner, resulting in some parts of the food being burned while other parts were inadequately heated.

The packages for solid food are rectangular plastic boxes with varying lengths and breadths while the system for liquid foods is based on an endless plastic tube. Food moves very quickly through the tube which, during cooling, is pressed together so that the diameter is about 20 mm. At the end of the process, the tube is sealed to form "Pillows" or Tetra cartons. In the Multitherm system, the food is first Vacuum Packaged in a special plastic foil, after which it is heated in a special plastic foil after which it is heated in water. Next, it is sterilized in a microwave chamber and is then immediately cooled to about 90 C. This is followed by further cooling and drying stages, ending with the outer-packaging of the goods. More from: Alfaster AB, Stockholm, Sweden.
Cardamom 18(3), 1985, 19

121. Plastic bag sealing machine

Arshad Electronics manufacture a machine for sealing plastic pouches filled with greasy substances such as ghee, oil and milk as well as powder. The compact machine consumes about 1 kW of electrical energy and can be operated by unskilled labour. A feature is that while sealing, the bag is heated from both sides and under pressure thus ensuring a perfect bond and seal. After this heat sealing, the pressure is not released from both sides until the bag cools down and this is achieved by cooling it with forced air. Thus the seal becomes permanent. Bags of 127 mm width can be sealed at a speed of nearly 3,000 bags per hour. The speed, temperature and pressure are adjustable. Since the bag is held perpendicular while being sealed, the contents do not spill out and, if by accident, some greasy material or powder sticks between the ends of the bags, it does not affect the sealing. The machine is available in table model or one with conveyor to seal bags of any size or gauge. For further information write to: Arshad Electronics Private Limited, 305 Hammersmith Industrial Estate, Sitladevi Temple Road, Mahim, Bombay 400 016
Industrial Products Finder 13(6), 1985, 59

ANALYSIS

122. Detection of palmolein in coconut oil

The scarcity and high price of coconut oil tempt the sellers to adulterate it with cheaper oils. Palmolein, available under controlled prices, has become a common adulterant for coconut oil, questionable under the Prevention of Food Adulteration Act (PFA). Detection of this adulterant, therefore,

becomes atmost important for quality as well as legal purposes. A simpler method has been developed for detection and estimation of adulteration of coconut oil with palmolein.

The method for the detection and estimation of adulteration in coconut oil with palmolein involves treatment of the oil with Carr-Price reagent. Presence of palmolein is indicated by the appearance of a bluey black colour. The pure coconut oil did not give any colour with the reagent. The extent of admixture of palmolein in the coconut oil can be determined by measuring the intensity of the colour at 700 nm.

The colour intensity of the reaction mixtures depended on the proportion of reagent, temperature and duration of heating, amenable to standardisation. It was observed that the colour intensity increased with increase in reagent volume upto 4 ml and excess addition reduced the colour. The maximum colour intensity was obtained at 60 C with an optimum heating for 1 hr. It was also observed that 4 ml of reagent added to oils (1 ml) in chloroform (1 ml) at 60 C as against coconut oil whichdid not give colour for a period of 1 hr were the optimum parameters for the development of colour.
The Journal of the Oil Technologists Association of India16(3), 1984, 89-90

COMMERCIAL INTELLIGENCE

PRODUCTION(RAW MATERIALS)

123. All-India Final Estimate of Cardamom,1983-84

State	Area (Thousand hectares)	Production in terms of Cured cardamom (Thousand tonnes)
Karnataka	29.5	1.7
Kerala	52.1	1.9
Sikkim	20.0	4.0
Tamil Nadu	4.2	0.4
All-India	105.8	0.8

Agricultural Situation in India 39(9), 1984, 747

124. All-India Final Estimate of Potato, 1983-84

State	Area (Thousand hectares)	Production (Thousand tonnes)
Andhra Pradesh	0.3	0.9
Assam	44.1	270.0
Bihar	132.6	1,237.9
Gujarat	10.6	299.5
Haryana	7.6	135.1
Himachal Pradesh	13.1	33.9
Jammu & Kashmir	1.9	3.3
Karnataka	11.5	81.8
Madhya Pradesh	29.0	343.7
Maharashtra	11.5	58.9
Manipur	2.0	10.5
Meghalaya	18.0	140.6
Nagaland	5.8	40.6
Orissa	9.5	80.8
Punjab	26.7	523.0
Rajasthan	2.2	7.4
Sikkim	4.2	17.0
Tamil Nadu	11.0	88.8
Tripura	2.6	34.2
Uttar Pradesh	312.5	5,757.4
West Bengal	146.1	3,066.3
Arunachal Pradesh	1.9	13.6
Delhi	0.3	2.0
Mizoram	0.6	2.8
All-India	805.6	12,250.0

Agricultural Situation in India 39(9), 1984, 746

125. Production of Meat in India

Quantity:000 tonnes.

Species of animal	Meat Production in India 1980	1981
Beef & Buffalo Meat	194	208
--Beef & Veal	74	78
--Buffalo	120	130
Mutton & Goat Meat	390	405
--Mutton & Lamb	120	125
--Goat Meat	270	280
Pig Meat	70	75
Poultry Meat	113	120
Total Meat	870	916

Profodcil Bulletin 19(2), 1984, 3-5

PRODUCTION (INDUSTRIAL)

126. Sugar Production

The total sugar production till 15.4.85 for the season 1984-85 was 56,73,000 tonnes as against 54,27,000 tonnes during the corresponding period last season.

The total closing stock of sugar with the factories as on 15th April, 1985 was 43,53,000 tonnes as against 54,92,000 tonnes on the same date last season.
Indian Sugar Mills Association Press Release, 13, May 1985

127 Production of rice bran oil

Year	Rice Bran Processed in lakh T.	Production of Rice Bran Oil in Lakh T.
78-79	6.8	1.01
79-80	7.8	1.13
80-81	9.2	1.30
81-82	10.6	1.50
82-83	10.9	1.52
83-84	13.0	1.83
84-85	15.0	2.30

The Economic Times 25 June 1985, 5

EXPORT

128. Exim Bank's New Schemes

EXIM Bank of India has announced two lending programmes for export oriented units and deemed exports to widen the coverage of banks lending programmes. According to Mr.R.C. Shah, Chairman and Managing Director of the Bank, Export oriented units set up in free trade zones and units recognised by Government of India as 100 per cent export oriented units would now be eligible for the Bank assistance, provided they satisfy the appraisal criteria and other norms besides evidencing capacity to penetrate new markets overseas.

The financial assistance of Bank could cover new projects as well as assist units undertaking expansion or modernisation of their set-ups. The benefits would be available in the form of term loans and deferred payment guarantee for acquiring plant and machinery besides land and building along with related services. He added that about Rs.20 crores might be tapped for the borrowers under the new schemes during 1985.
Cardamom 18(3), 1985, 13

129. Export duty on black pepper

The Government of India have imposed an export duty of Rs. 3 per kg. on black pepper with effect from 7th May 1985.

Notification Nos. 147 & 148 Customs dt. 7-5-85 issued in the Extra-ordinary Gazette of same date have the effect of withdrawing the exemption from export duty on black pepper and subjecting black pepper to an export duty at the rate of Rs. 3 per kg.

Spices News Letter 19(5), 1985, 11

130. Trend in Exports of Processed Foods

Quantity:Tonnes
Value :Rs.in Lakhs

Item	1981-82		1982-83*		1983-84	
	Qty	Val	Qty	Val	Qty	Val
Mango Juice	11265	723	11166	701	3732	276
Other Canned & Bottled fruits	18198	1421	51056	4770	25899	2506
Canned Vegetables	1785	145	971	85	879	82
Dehydrated Vegetables	1532	191	1063	180	1119	182
Pickles & Chutney	8857	746	6233	568	6722	652
Fresh Meat	7857	1359	10889	1993	11829	2247
Frozen Meat	47068	4667	40689	4172	26267	3020
Canned Meat	2063	507	2512	533	1653	320
Poultry Products	-	405	-	59	-	69
Animal Casings	365	241	-	274	-	202
Confectionery & Sweet Meat	259	38	73	15	148	23
Biscuits	3065	306	2810	279	1990	187
Guar Gum	113900	10809	44622	3516	28484	1604
Gkuar Meal	4082	67	3938	56	2622	45
Non-Alcoholic Beverages	165	19	-	29	-	20
Alcoholic Beverages	819837(L)	84	-	45	-	44
Wheat Bran	33	Neg	-	-	-	-
Malted Milk	668	109	1285	245	916	178
Ghee	273	101	357	151	372	150
Starch & its derivatives	16241	358	3256	85	1692	36
Papads	2139	219	1898	207	1705	207
Instant Coffe	1300	1300	***		***	
Instant Tea	838	487	***		***	
Cocoa Products	1127	291	463	138	70	24
Walnuts in Shell	2829	379	526	56	586	56
Walnut Kernels	4232	733	3299	748	2008	448
Mushrooms	47	211	60	355	50	300
Other Processed Foods	-	397	-	414	-	577
Fresh Mangoes	7483	673	8043	674	12500	1100
Other Fresh Fruits	18115	646	8400	610	8357	471
Fresh Vegetables	26716	799	13932	860	26582	1706
Fresh Onions	169771	2944	184411	3237	183883	3587
Fresh Potatoes	4547	52	6974	39	285	7
Basmati Rice	309750	17479	178078	10522	141664	9602
Other Rice	562782	19299	351442	12857	-	-
Barley	44366	802	2169	39	600	9
Maize	27	1	248	5	1643	34
Floricultural Products	-	60	-	30	-	40

*Provisional
(L) Litres
Profodcil Bulletin 19(2), 19814, 43-44

131. Export of Live Animals

Quantity: Nos
Value : Rs in lakhs

Year	Sheep & Lambs		Goats & Kids		Bovine Animals	
	Qty	Val.	Qty.	Val	Qty.	Val.
1977-78	50640	12.6	115719	27.8	17704	36.1
1978-79	13430	3.3	499061	1.08	10359	24.0
1979-80	22877	5.9	32004	5.3	5238	11.4
1980-81	113106	31.0	11490	2.8	22234	46.3
1981-82	24433	6.8	2062	0.8	18110	35.8
1982-83	N.A.	N.A.	N.A.	N.A.	52844	71.3

ii) Export of Meat

Quantity: M.tonnes
Value: Rs. in million

Year	Fresh Meat		Frozen Meat		Canned Meat		Total	
	Qty.	Val.	Qty.	Val.	Qty.	Val.	Qty.	Val.
1978-79	7102.5	99.3	15903.5	126.1	453	5.7	23459.0	231.1
1979-80	6786.8	89.1	26577.6	222.0	1916	31.4	35280.4	342.5
1980-81	2185.5	34.9	41720.8	374.0	2512	46.1	46418.3	455.0
1981-82	8602.0	155.3	47068.4	466.7	2063	50.7	57733.4	672.7
1982-83*	10889.0	199.3	40699.0	417.2	2512	53.3	54090.0	669.8
1983-84	11829.0	224.7	26267.0	302.0	1653	32.0	39749.0	558.7

* Provisional

Profodcil Bulletin 19(2), 1984, 11

132. Coffee is second most popular beverage in U.S.A.

Coffee is the second most popular beverage, in per capita consumption, in the United States, according to a recent study (Feb. 1985) by Beverage Industry. According to the study, soft drinks took the first rank, beer the third, and milk the fourth.

Beverage	Annual per capita consumption (in gallons)	
	1983	1984
Soft drinks	41.5	43.2
Coffee	27.0	27.3
Beer	23.5	23.0
Milk	20.9	21.1

Indian Coffee 49(5), 1985, 8

TRADE INFORMATION

133. ECGC Documentation Centre

The Export Credit Guarantee Corporation has set up its Documentation Centre at Dalamal House in Bombay. The Centre is engaged in acquisition, analysis, storage, retrieval and dissemination of information on export trade and credit insurance.

At present the Documentation Centre has 1550 books and 850 reports. Books on subjects like International Trade, Financing of Foreign Trade, Credit Insurance, Credit Management, India's Foreign Trade, Banking, Insurance and Management have been acquired.

The Documentation Centre is located on the third floor of Dalamal House, Jamnalal Bajaj Marg, Nariman Point, Bombay 400021. The working hours are 10.30 A.M. to 5.00 P.M. on week days (Saturdays: 10.30 A.M. to 1.00 P.M., except second Saturdays).

The Documentation Centre-a reference facility-is open and free to all exporters.

The Documentation Centre regularly receives country reports from Barclays Bank, Economist Intelligence Unit, London; Lloyds Bank Group Economic Report, Midland Bank International and National Westminster Bank. The reports provide latest information on economic and political developments in various countries.
Spices News Letter 19(5), 1985, 11

134. DGTD office in Bombay soon

The Central government has decided to set up an office of the Directorate General of Technical Development (DGTD) in Bombay according to Mr. O.P. Gahrotra, joint chief controller of imports and exports.

The Bombay office would start functioning very soon. The government's decision is in response to the repeated pleas of business community to avoid delays in issuing licences.
The Economic Times 4 June 1985, 1

135. Manufacturers of Canned Meat sion

Brooke Bond India Limited,
Gevrai Factory, Post Box No.96,
Aurangabad-431 001

Monte da Silva,
Rua do Abade Faria,
Margao, Goa-403 601

Costa & Company Pvt. Ltd.,
Post Box No.16,
Margao, Goa - 403 601

Essex Farms Pvt. Ltd.,
4, Aurobindo Marg,
New Delhi 110 016

Mafco Limited,
Mistry Bhavan, 6th Floor,
Dinshaw Vachha Road,
Bombay 400 020

Taj Bajjina Food Processors Ltd.,
1021, Navajivan Society, Building No.3,
Lamington Road, Bombay - 400 008

Gitwako Farms,
42, Birbal Road, Jangpura Exten-
New Delhi 110 014

Mohammed Yunus & Bros P. Ltd.,
C-1, Okhla Industrial Estate,
New Delhi - 110 020

Central Dairy Farm,
Aligarh

Profodcil Bulletin 19(2), 1984, 21

36. Manufacture of canned fruits and vegetables.

This contains the list of manufacturers (addresses) of canned fruits and vegetables in different states of India.

Andhra Pradesh

Alankar Fruit Products,
Borwancha,
Vijayawada

Andhra Pradesh State Agro Industries Development Corpn. Ltd.,
10-2-3 A.C. Guards, Agro Bhuvan,
Hyderabad - 500 004

Bhagyalakshmi Fruit Canning Industries,
No. 4-7-9 Conor, Bungalow Road,
Greamspet, Chittoor 517 002

Cicar Dehydrates Ltd.,
Post Box 77
Kakinada - 533 009

Indian Canning Industries,
18-1-235, High Road,
Chittoor - 517 001

Krishna Fruit Products Ltd.,
Eenadu Compound, Somajiguda,
Hyderabad- 500 004

Nava Bharath Food Products
NNR Mills, 37/38 Damalcheruvu Road,
Pakala, Chittoor District-517 112

Poorna Processed Food,
Aragonda P.O.,a B.Palyam Taluk,
Chittoor Dt.

Sri Krishna Fruit Canning Industries,
18-1-3/1, High Road,
Chittoor - 517 001

Southern Food Products,
18-1-3/1, High Road,
Chittoor - 517 001

South India Mango Pulp Co. Pvt. Ltd.,
Tallamada, Narayanapuram P.O.
Sattupalli Taluk, Khammam Distt.

Sree Ramachandra Fruit Products,
Edara, Nuzvid Taluk,
Krishna Distt. - 521 032

Super Industries,
Post Box No.16,
Tirupati - 517 501

Sri Venkateswara Food Processing Ltd.,
N.P. Road,
Nidadavole - 534 303, West Godavari distt.

Sree Sreenevasa Fruit Processing Industry,
Nuzvid 521001

Venugopal Fruit Processed Industries,
1-2-27 Katta Manchi,
Chittoor

Assam

Agro Canners,
P.O. Bukhanpukhri
Tinsukia - 786 146

Assam Hills Small Industries Dev. Corpn. Ltd
Dev. Corpn Ltd.
Zoo Road, Gauhati - 781 006

Fruito's & Col,
G.S. Road, Khanapura,
Gauhati - 781 002

North Eastern Regional Agricultural Rajgarh Road, Gauhati - 781 003

Bihar

Mahadeo Fruit Processing Industry,
Kishanganj - 855 107

Hind Fruit Products,
D.N. Singh Road,
Bhagalpur - 812 002

Delhi

Kaytis Food Preservers,
4, Paharganj Lane,
New Delhi 110 020

Nafed Processed Foods,
A-6, Lawrence Road, Industrial Area,
Delhi - 110 035

Northland Industries,
2254, Rajguru Road, Chuna Mandi,
New Delhi - 110 055

Midland Fruit & Vegetable Products (India) Pvt Ltd.,
158/159, P.O. Okhla Industrial Estate,
New Delhi- 110 020

Goa

Monte da Silva,
Rua do Abade Faria,
Margao 403 601

Gujarat

Gujarat Agro Industries Limited,
Khetudyog Bhavan, Opp. High Court,
Navrangpura, Ahmedabad 380 014

Modern Food Products
P.B.No. 709, Plot No. 507,
G.I.D.C. Estate, Makarpura,
Baroda - 390 010

Vafa Products,
D-3, Industrial Estate,
B.I.D.C. Gorwa Road, Baroda - 390 016

Haryana

Haryana Agro Foods and Fruit Processing Plant
Murthal (Sonepat)

Mahajan International
Div of Panipat Foods Ltd.,
Panipat

Himachal Pradesh

Himachal Pradesh Horticultural Produce Marketing & Processing Corpn Ltd.,
Fruit Processing Plant, Parwanu - 173 220

Jammu & Kashmir

H.A. Rahim & Co.,
Raj Bagh,
Srinagar - 190 008

Jammu & Kashmir State Agro Industries Development Corporation
Khunmoh Industrial Complex, Post Bag No. 33.
Srinagar

Karnataka

Ashoka Fruits Pvt. Ltd.
143 D, Bommasandra Industrial Area,
Hosur Road, Bangalore

Blue Mountain Food Products Ltd.,
P.B. No. 1676, Old Madras Road,
Bangalore - 560 016.

Coorg Fruits and Vegetables Cooperative Processing Society Ltd.,
Kushalnagar, Dt. Coorg.

Coorg Orange Growers' Cooperative Society Ltd.,
Gonikoppal, Dt. Coorg.

Fruits and Foods Pvt. Ltd.,
Bannerghatta Road,
Bangalore - 560 079

Fruitin Exports Private Limited
1116, Jhansilakshmi Bai Road,
Chamundipuram, Mysore - 570 008

Glendale Fruits Processors Pvt Ltd.,
61, Palace Cross Road,
Bangalore - 560 020

Globe Foods Pvt. Ltd.,
33, Church Street,
Bangalore - 560 001

Indian Food Products,
4566, Opp. Forest Office,
P.B. Road,Belguam - 590 002

Jagdale Exports,
532, 17thy Kilometre, Kengeri,
Bangalore-560 060

Kamadhenu Cooperative Dairy Fruit Processing Society Ltd.,
Sirsi, Dt. North Canara

Kissan Products Limited,
Old Madras Road,
Bangalore 560 016

Karnataka Agro Industries Cropn. Ltd.,
Hebbal,
Bangalore 560 024

Mysore Fruit Products Ltd.
P.B.No.8615,
Mahalakshmipuram
Bangalore 560 086.

Mysore Canning Company,
Plot No. 31, Food Industrial Estate,
Mysore-Belagola Industrial Area,
KRS Road,
Metagalli Post, Mysore-570 016

Sun Canning Pvt. Ltd.,
Post Box 32,

Tropican (India) Pvt. Ltd.,
13, Meenakshi Koil St,
Shivaji Nagar, Bangalore - 560 032

Kerala

Azad Canning Company,
Kallai,
Calicut - 673 003

Canning Industries Cochin Ltd.,
Valarkavu,
Trichur - 680 006

Darico Canning Limited,
Moospet Road, P.O. Box No.96,
Trichur - 680 005

Kalyan Products,
Kuttanellur
Trichur 680014

L.R.Rangaier Sons Pvt. Ltd.,
Post Box No. 163,
Kozhikode 673 001

Malabar Fruit Products Company,
XXXVI/896, M.G. Road,
Cochin - 682 011

Malabar Coast Products,
Palathinkal House,
Kottayam 686 00

N.S.Natural Products
Naduvathuparampil-III,
Kaviyoor, Thiruvallpa

Pierce Leslie Ltd,
Bristow Road, Willingdon Island,
Post Box No. 565, Cochin 682 003

Pio Food Packers,
Kuriachira,
Trichur - 680 006

Visko Food Products,
Vashakulam P.O.
Muvattapuzha

Maharashtra

American Dry Fruit Stores,
17-G, Cawasji Patel Street,
Vardhman Chambers, 5th Floor,
Bombay - 400 023

Balrampur Food Processors
757 Azad Chowk,
Yeola, Dist. Nasik

B'Kar Products,
Bhiwapur (Dist Nagpur)

Century Foods,
Suhul-Mahableshwar Road,
Panchgani (Distt. Satara)

Corn Products Co. (India) Ltd.,
Shree Niwas House, H.Somani Marg,
P.O. Box 994, Bombay - 400 001

Duke & Sons Pvt. Ltd.,
Off Sion Trombay Road, Chembur,
Bombay - 400 088.

Foods & Inns Limited,
Regent Chambers, 13th Floor,
Nariman Point, Bombay - 400 021

Golden Nectars Pvt. Ltd.,
67, Podar Chambers
Fort, Bombay - 400 001

Herbertsons Limited,
22, Homi Mody Street,
Bombay - 400 023

Manak Citrus Products Private Ltd.
At& Post Utran,
Distt. Jalgaon

Mala's Fruit Products,
Village Bhose,
P.O. Panchgani - 412 605

Merryweather Food Products Ltd.,
F-24, MIDC Area, Satpur,
Nasik 422 007

Ratnakar Canning Industries,
Industrial Estate,
Ratnagiri

Shingote Processed Foods Pvt. Ltd.,
'Prasant 636/6, Vijayanagar Colony,
Poona - 411 - 030

Snehanki Processors,
C-3, MIDC Hingna, Industrial Estate,
Nagpur - 440 028

Sunna Instant Soft Drinks & Essences,
Motibagh Bhiwapur,
Dhanfoli, Nagpur 440 012

Maharashtra Agro Industries Development Corpn. Ltd.
Interpub, Mangalore Road,
Ballard Estate, Bombay 400 038

Tim Tom Food Products,
Shanti Nagar, Vakola, Santa Cruz (East),
Bombay 400 055

Tropical Fruit Processors,
279 Middle Ring Road, (East) Extension,
Wardhaman Nagar, Nagpur - 440 008

Vasundhara Canning Pvt. Ltd.,
113, Commerce House,
140, Nagindas Master Road,
Fort, Bombay 400 001

Wimco Limited,
Indian Mercantile Chambers,
Ramjibhai Kamani Marg,
Ballard Estate, Bombay - 400 038

Madhya Pradesh

Madhya Pradesh State Agro Industries Development Corpn. Ltd.,
3rd Floor, 'Panchanan',
Malviyanagar, Bhopal 462 003

Manipur

Government Fruit Preservation Factory
Mantri Pakhri
Imphal 795 002

Mizoram

Government Fruit Preservation Factory,
P.O. Vairengete,
Mizoram

Punjab

Glacier Products (India) Pvt. Ltd.,
Pathankot - 145 001

Markfed Canneries,
122/453, G.T. Road, P.B.No. 112,
Jullundur

Punjab Agro Fruit & Vegetable Products Ltd.,
Govt. Seed Farm,
Abohar 152116

Yadavendra Industries,
New Moti Bagh Palace,
Patiala

Sikkim

Government Fruit Preservation Factory,
P.O.Singtam, Sikkim

Tamil Nadu

Foods Fats & Fertilizers Ltd.,
P.B. No. 759 Fountain Plaza, 7th Floor,
Pantheon Road, Madras - 690 008

Nektar Fruit Products Ltd.,
Baglur Post Hosur Taluk,
Dharmapuri Distt. 635 103

Parnar Food Company
27 Panagal Road,
Shenoy Nagar, Madurai - 625 020

Sri Devraj Fruit Products Pvt Ltd,
Netaji Road, Krishnagiri - 635 002

Tripura

Tripura Small Industries Corpn. Ltd.,
33, Office Lane,
Agartala Lane, 790 001

Uttar Pradesh

Allahabad Canning Company,
P.O.Bamrauli,
Allahabad- 211 012

Canners (India) Limited,
60, Purana Quila,
Lucknow 226 001

Mohan Meakin Breweries Ltd.,
Mohan Nagar
Ghaziabad (U.P.)

S.R.Cannery,
151, Rasulabad,
Allahabad 211 004

U.P. State Horticultural Product Marketing and Processing Corpn. Ltd.,
22, Vidhan Sabha Marg, Lucknow

West Bengal

Alpha Foods & Chemicals (P) Ltd,
55/6, Canning Street,
Calcutta- 700 001

Amarnath Fruit Products Pvt Ltd.,
Salbari, P.O. Sukna,
Distt. Darjeeling - 734 225

Darjeeling Fruits (P) Ltd.,
Sevoke Road,
Siliguri 734 401

Darjeeling Fruit and Vegetable Processing Cooperative Society,
P.O. Matigara, Dist. Darjeeling

Eastern Food Products,
Rabindra Path, Birati,
Distt.24 Parganas

Fruitsworth Industries Pvt. Ltd.,
55/36, B.R.B. Basu Road,
Calcutta 700 001

Himalayan Fruit Preservers
151, Sreema Sarani, Babupura,
Siliguri 734 404

Hindustan Fruit Processing Works,
Assam More, P.O. Mohit Nagar,
Dist. Jalpaiguri

Hima Valley Fruit Pvt. Ltd.,
Saibal Mansion, Hill Cart Road,
Siliguri 734 401

India Fruit Preserving,
Kathambari

Indus Fruit Products,
Raja Rammohanpur

Mason's Products,
24, Rajendra Nath Mukherjee
Road, 5th Floor,
Calcutta-700 001

Mausam Fruit Preservers,
Milanpalli, Siliguri

Pals' Fruit Products,
Deshabandhupura,
Siliguri 734 404

Rehabilitation Industries Corpn
Ltd.,
25, Free School Street,
Calcutta 700 016

Siliguri Canning Industry,
P.O. Baghdeers,
Darjeeling

Gita Fruit Products,
P.O. Bachamari,
Distt. Malda

Tims Products Limited,
Belgharia,
Calcutta 700 056

Tulip Products,
37, Imadad Ali Lane,
Calcutta 700 016

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FOOD REGULATION,QUALITY CONTROL AND HYGIENE

137. Prevention of Food Adulteration (3rd Amendment Rules 1985)

G.S.R. 293(E)--Whereas certain draft rules further to amend the Prevention of Food Adulteration Rules, 1955, were published as required by sub-section (1) of section 23 of Prevention of Food Adulteration Act, 1954 (37 of 1954) with the notification of Government of India in the Ministry of Health and Family Welfare (Department of Health) No.G.S.R. 87(E), dated the 1st March, 1984, in the Gazette of India, Extraordinary, Part II, Section 3, Sub-section(i) dated the 1st March, 1984, at pages 1-6 inviting objections and suggestions from all persons likely to be affected thereby before the expiry of ninety days from the date on which copies of the Gazette of India in which the said notification was published, were made available to the public;

And whereas the copies of the said notification were made available to the public on the 1st March, 1984;

And whereas the objections and suggestions received from the public on the draft rules have been considered by the Central Government;

Now, therefore, in exercise of the powers conferred by sub-section (1) of section 23 of the said Act, the Central Government, after consultation with the Central Committee for Food Standards, hereby makes the following rules further to amend the Prevention of Food Adulteration Rules, 1955, namely:-

RULES

1. (1) These rules may be called the Prevention of Food Adulteration (Third Amendment) Rules, 1985:

(2) They shall come into force after a period of six months from the date of their publication in the Official Gazette.

2. In the Prevention of Food Adulteration Rules, 1955 (hereinafter referred to as the said rules), in rule 15, for clause (a), the following clause shall be substituted, namely:-

"(a) Code number and Serial number of the Local (Health) Authority".

3. For rule 18 of the said rules, the following rule shall be substituted, namely:-

"18.Memorandum are impression of seal to be sent separately--

A copy of the memorandum and specimen impression of the seal used to seal the packet shall be sent, in a sealed packet separately to the public Analyst by any suitable means immediately but not later than the succeeding working day."

4. In rule 24 of the said rules,--

(1) for the words "ARTIFICIALLY COLOURED", the words "CONTAINS PERMITTED COLOURS" shall be substituted;

(2) the proviso occurring at the end shall be omitted.

5. In sub-rule (2) of rule 40 of the said rules, the words 'The product containing added natural flavour shall be labelled as "CONTAINS ADDED FLAVOUR" whereas the product containing synthetic flavour, shall be labelled as "ARTIFICIALLY FLAVOURED" occurring at the end shall be omitted.

6. For sub-rule (1) of rule 50 of the said rules, the following sub-rule shall be substituted, namely:-

"(1) No person shall manufacture, sell, stock, distribute or exhibit for sale any article of food, including prepared food or ready to serve food, except under a licence:

Provided that the fruit products covered under the Fruit Products Order, 1955, solvent extracted oil, deoiled meal and edible flour covered under the Solvent Extracted Oil, De-oiled Meal and Edible Flour (Control) Order, 1967, Vanaspati covered under the Vegetable Oil Products Control Order, 1947, and meat and poultry products covered under the Meat Food Products Order, 1973, shall be exempted from the above rule."

7. After rule 64B of the said rules, the following rule shall be inserted, namely:-

64BB, Extraneous addition of flavouring agent to be mentioned to the label where an extraneous flavouring agent has been added to any article of food, there shall be written on the lable attached to any package of food so flavoured, a statement in capital letters as below:-
"CONTAINS ADDED FLAVOUR"

8. In Appendix A to the said rules --

(1) in Form II, to para 1, the following shall be added at the end, namely:-
"--------and I am of the opinion that--------";

(2) in Form III, for the words "a sample of--------for analysis", the words and bracket "a sample of -------bearing Code number and Serial number--------of the Local (Health) Authority for analysis" shall be substituted;

(3) in Form VII, for the figure and words "1. Serial number of the sample", the figure, words and brackets "1. Code number and Serial number of Local (Health) Authority" shall be substituted.

S.V.SUBRAMANIAN
Jt. Secy.
(No.F-15014/4/83-PH
(F & N) PFA - Vol.I

The Gazette of India
Part II, Section 3-Sub-section (i)
No: 121, 23 March 1985

HYGIENE

138. Kokum fruit could reduce obesity

Scientists at the National Institute of Nutrition (NIN), Hyderabad, have found definite leads that dry Kokum fruit used as a substitute for tamarind in Western India can help in preventing obesity.

Hydroxy citric acid-main component of dried kokum, a plum like sour fruit has been identified by Dr. Shenolikar's group at the institute to inhibit obesity in man.

People living along the western coast of India are generally known to use dried Kokum fruit (Garcinia indica) in place of the popular tamarind in preparation. There has been a widespread belief that these populations have less obese people compared to the rest of the country.

Shenolikar said tests on experimental animals had conclusively shown at the institute that intake of the hydroxy citric acid through kokum prevented fat and cholestorol synthesis in them.

However trials on human volunteers given acid juice for a month exhibited a marked increase in the circulation of insulin in their system. Shenolikar said this new factor could well open up enough scope to probe the acid's utility to diabetic patients suffering from insulin shortage.

Experiments in American laboratories on hydroxy citric acid (generally not found in other fruits) showed that it had the capability to inhabit synthesis of fat and cholestolral.
PTI Science Service 4(11), 1-15 June, 1985, 11

139. Coating of vessels helpful

The time honoured procedure in India of getting the brass utensils coated with Kallai (molten tin mixed with a small percentage of other metals), prevents copper contamination of milk boiled and stored in these utensils, report Dr.B.Bhandari and Dr. B.Sharda of Ravindra Nath Tagore Medical College, Udaipur. In a recently published report, the researchers found that the copper concentration of cow's milk rises four and a half times from 0.22 mg per litre to 0.99 mg per litre when boiled and stored for six hours in an uncoated brass vessel as compared to almost no rise from 0.22 mg per litre to 0.24 mg/l in kallai (tin) coated vessel.

The tin coating (kallai), the researchers advocate, may therefore, prove to be a life saving measure to prevent the deadly liver disease, Indian Childhood Cirrhosis, caused by excessive copper ingestion in the sibling of the families whose children have died of the disease.
Indian J. Nutrition and Dietetics 21(4), 1984, 150-1

140. Probing the capital's stomach

One-third of all Londoners will suffer from atleast one disease that is related to their diet. It could be anything from constipation to diabetes. The assertion was made last week at the launch of London Food Commission, an independent body, funded with £ 1 million from the Greater London Council, that wants to improve the capital's diet.

It will provide impartial information, monitor the doings of the food industry and its £300 million advertising budget, and keep an eye on the safety of food additives.

Other areas for research may include the effects of poverty on diet. The Commission's first director, Dr Tim Lang from the Food Policy Unit at Manchester Polytechnic, says a study in the North of England found that 40 per cent of the unemployed missed meals for lack of money.
New Scientist 106(1454), 2 May 1985, 7

141. Drive to identify invaders of body's defences

The need to identify and evaluate the environmental agents which attack the immune system was emphasized at a special seminar in Luxembourg in November last year.

The International Seminar on the Immunological System as a Target for Toxic Damage was told how the immune system - the body's defence against disease - was itself subject to attack by toxic substances, the so-called immunotoxic xenobiotics.

These foreign and unwanted compounds enter the body through the air, diet or other means. They cause a lowering of the body's resistance, allowing an increasing incidence of infections and tumours.

The seminar was one of a series organized by the Commission of the European Communities (CEC) and the International Programme on Chemical Safety (IPCS). The seminar was co-sponsored by the US Environmental Protection Agency and the US National Institute of Environmental Health Sciences. The International Society of Immunopharmacology also participated.

Some 215 scientists from 28 countries, representing the six regions of WHO and all Member States of the CEC, took part.

Participants were from many different disciplines, for example, immunology, pathology, toxicology, and from many interest groups such as universities, governments and industry.

It was recommended that steps be taken at the international level (e.g. IPCS, CEC, UNEP) to collect all available information on the effects of chemicals on the immune system, to establish criteria for the testing and evaluation of immunotoxic substances presenting potential health risks and finally to promote training programmes in immunotoxicology at national and regional levels.

A better clarification of the possibly greater role than previously, recognized that immunotoxic substances play in a larger number of adverse health effects is dependent on further basic and applied research. In concert with clinical and epidemiological studies, laboratory testing will provide the rationale for control strategies required to prevent undue exposure to immunotoxic chemicals.

The presentations, reports, conclusions and recommendations from the seminar will be published soon.

Many participants approved the initiative of the organizers in meeting a very definite need for this seminar. They also welcomed IPCS involvement as evidence of an essential international approach to the resolution of a complex aspect of toxicology.

Sentinel 1(3), April 1985, 6

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

NEW INDUSTRIES

142. General Foods Corporation's Mysore Project

General Foods Corporation Limited has been promoted by the Kotharis of Madras and General Foods Corporation of the US for undertaking the manufacture of processed food products. The technical know-how and marketing expertise will be provided by the US interests.

The construction of the factory in a notified industrially backward area in Mysore has commenced with laying of the foundation stone by Mr. G.D. Wollert, Vice-President of the US firm recently. It is expected that this project will be on stream towards the end of 1986.

The powdered food beverages have been successfully test marketed in different centres in India while it is claimed that Maxwell soluble coffee will be of high quality and the aroma will be preserved. because of the new process being adopted in its manufacture. A pilot plant for powdered beverages has been functioning for this purpose in Hassan since 1984. Other food products too will be taken up for production over a period.
The Hindu 10 May, 1985

143. Rice bran oil plants with Japanese knowhow

Five plants are being installed - four of them in Andhra Pradesh and one in Tamil Nadu (Musiri) - with Japanese knowhow for production of rice bran oil. Food, fats and fertilisers which has acquired the Japanese technology, is supplying the process and the equipment, some of it imported from Japan, are now under erection at different places under the supervision of Japanese experts.

Mr. S.B. Goenka, Director of Foods, Fats and Fertilisers, told newsmen here that in a matter of months rice bran oil, a wholesome cooking and frying medium and a salad oil, would be available to Indian housewives. Dr. Kuriwaki and Mr. Tsuji, both from the Japanese firm Oshino Seisakusho, which developed the technology, who are supervising the erection of machinery explained the salient features of the technology called the Hygain process. Describing the characteristics of the oil, they said it was one of the most nutritious oils containing predominantly poly-unsaturated fats.

Mr. Ramanathan, Director of Cethar Food Oil Ltd. which is putting up the plant at Musiri, said that in a record period of

nine months from the time work was begun, the plant would be in production. He said that the production from his plant and the other four other plants was expected to save foreign exchange to the tune of Rs. 35 crores.

Mr. Goenka pointed out that India, the second largest producer of rice in the world, offered a potential of six lakh tonnes of rice bran oil and yet only 2.5 lakh tonnes of oil was produced including a meagre 15,000 tonnes in edible grade. The technology is not there even though work has been carried on in this area for years" he observed. For the first time, with Japanese technology, rice bran oil, now used for soap making, was going to be processed to edible standards.
The Hindu 30, June 1985 6

PERSONALIA

44. S.S. Ahuja, new dy. chairman of Tea Board

Mr. S.S. Ahuja, an IAS officer of the West Bengal cadre and currently district magistrate of Burdwan, has been appointed deputy chairman of Tea Board, it is learnt. Mr. Ahuja will succeed Mr. R.K. Tripathy.
The Economic Times 3 June 1985

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Nil.

STORAGE AND INFESTATION

145 An efficient storage cum drying bin for paddy

A high moisture storage bin that can safely store water soaked paddy has been successfully field tested by an engineer of the Indian Grain Storage Institute's field station at Hyderabad. The outdoor vertical storage structure erected at the Ramakrishna Mission Students Home in Malliankaranai village, 83 km from Madras has been used for three seasons from January 1984.

"It works very well, and the moisture gets reduced in about a month's time even under adverse conditions says Mr.A.S. Nagarajan, Estate Manager of the Home. The very first loading was of grain with 20 per cent cent moisture which was reduced to a level of 14.5 per cent moisture in November last, grain with upto 23 per cent moisture was stored in the bin and the moisture level was reduced to about 14%. The grains were stored for more than five months maintaining original lustre, according to Mr. Nagarajan. The milling recovery of the stored paddy was normal and the percentage of recovery for raw rice was about 65.

The 2.5 metre high bin with a diameter of 1.4 metres has a capacity to hold 3 tonnes (30 bags, of grain) and it costs Rs. 5,000. It is erected on four 60 cm high brick pillars. It is easy to load through the opening on the top, and the grains can be collected at the bottom by gravity flow.

"Made of galvanised iron sheets, this bin is a two shell contraption cylindrical in shape. The inner shell made of 22 guage GI perforated sheets holds the paddy and facilitates air breathing, while the outer shell of 24 guage GI plain sheet offers protection as well as annular space to cushion atmospheric variations," says Mr. G. Shankar. Agricultural Engineer, who designed this novel bin.

The bottom of the bin is also perforated and it helps in draining the excess moisture dripping from the stored grain. Air escaping from the inner bin gets diffused in the annular space between the two concentric shells and moves out through the vent holes provided at the top all along the circumference of the outer shell. A pair of air-control sliding gates is also incorporated in the outer shell to control the quantum of air seeping into the grains at any given time.

There is a slow and steady flow of air (through natural convection process), the high humidity air from the grains gets out continuously seeking a dynamic equilibrium with the atmospheric relative humidity. "The temperature inside is also dynamic as a result of this and the moisture from the grains is gradually removed, "says Mr. Shankar.

"This bin is rat-and rain-proof, and it facilitates fumigation to control stored product pests," says Mr. G.P. Ranganathan, Deputy Director of Save Grains Campaign, Madras, who monitored the progress of the experimental bin. Fumigants such as ethylene di bromide (EDB) at 6 ml per quintal of paddy should be added to the inner-shell, which stores the grains, after carefully sealing all the vents, according to him.

"It is an excellent storage-cum-drying system without any power and zero maintenance says Mr. Nagarajan, who has been helping in recording all technical parameters for the experimemt. Many farmers from the neighbouring tracts are eager to have such bins in their farms, according to him.

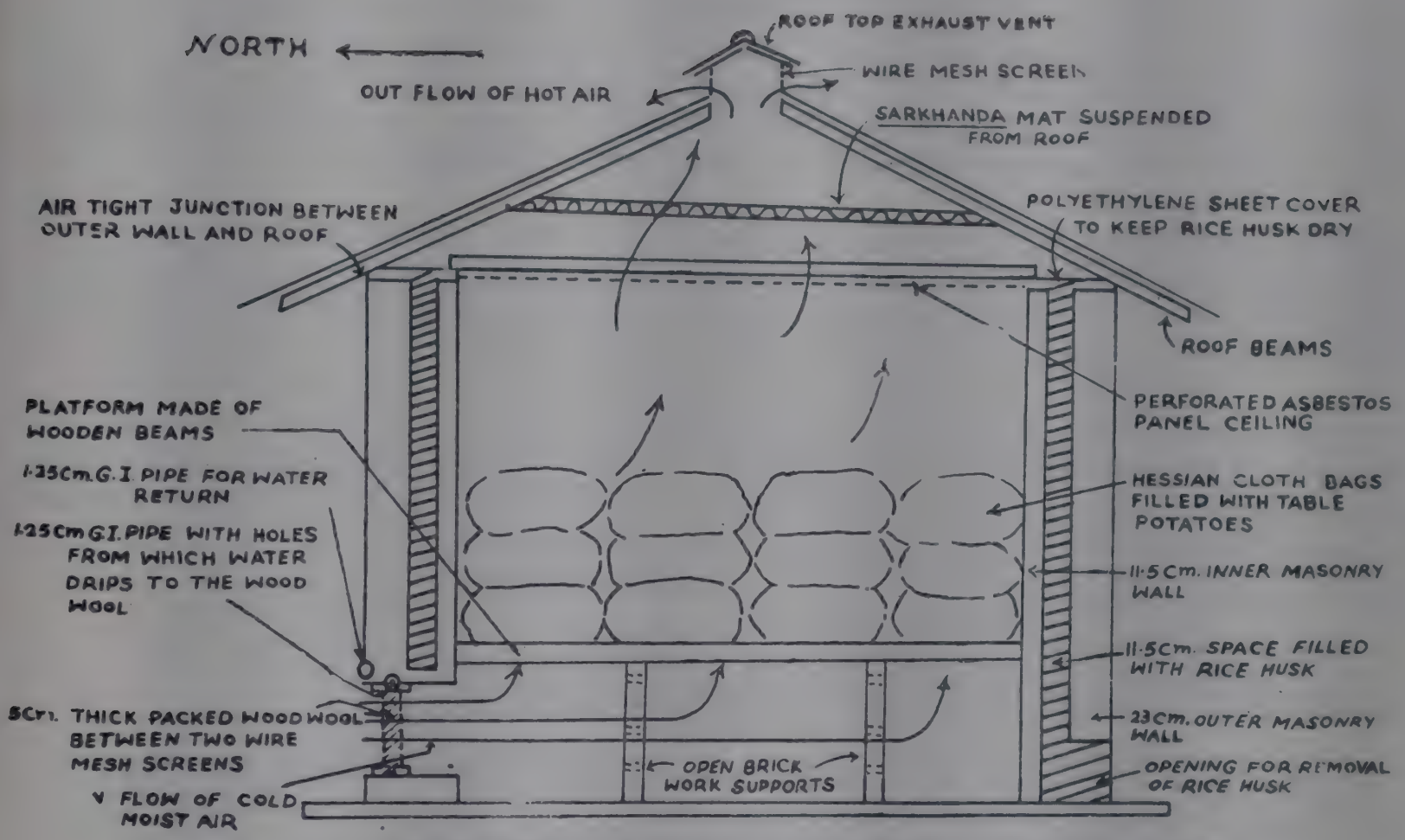
"This efficient vertical bin occupies less space and it will be a boon for the several thousand farmers in Thanjavur, Tiruchi and South Arcot, whose "kuruvai" crop invariably gets caught in the monsoon rains during harvest" says Mr. Ranganathan. The Grain Storage Institute will provide technical assistance to all those who are interested in the storage-cum-drying system he says.
The Hindu 24 July 1985, 24

146 A potato store run on passive evaporative cooling

A 20 tonnes prototype store has been constructed for storing potatoes. The store is a 9.1 x 4.6 x 3.7 m brick masonry structure (see sketch). Its longer, northern and southern walls have double-walled construction with rice husk insulation in between. The outer walls bear the weight of the roof.

Eight ventilator (76 x 60 cm) go through the double walls on the northern side and three similar ventilators through the eastern wall, all located 15 cm above the floor level. The outer openings of the ventilators are covered with chicken wire mesh fitted on wooden frames. Behind this wire-mesh is a layer of packed wood-wool about 5 cm thick which is held in place by another wire-mesh on the inner side. The wood-wool is continuously moistened by water dripping from small holes in a 1.25 cm water pipe running along the top of the ventilators. The water supply is a closed loop system so that all the ventilators are supplied with the same amount of water. The water is supplied from a 0.90 x 1.2 x 0.9 m masonry and concrete water tank built at a height of 1.2 m from the ground outside the building along the western wall of the store.

The ceiling is made of plywood sections mounted on wooden beams. Holes of about 5 cm diameter are drilled on the plywood


NORTH
ROOF TOP EXHAUST VENT
WIRE MESH SCREEN
OUT FLOW OF HOT AIR
SARKHANDA MAT SUSPENDED FROM ROOF
AIR TIGHT JUNCTION BETWEEN OUTER WALL AND ROOF
POLYETHYLENE SHEET COVER TO KEEP RICE HUSK DRY
ROOF BEAMS
PERFORATED ASBESTOS PANEL CEILING
PLATFORM MADE OF WOODEN BEAMS
1·25Cm.G.I. PIPE FOR WATER RETURN
1·25Cm G.I. PIPE WITH HOLES FROM WHICH WATER DRIPS TO THE WOOD WOOL
HESSIAN CLOTH BAGS FILLED WITH TABLE POTATOES
11·5Cm. INNER MASONRY WALL
11·5Cm. SPACE FILLED WITH RICE HUSK
5Cm. THICK PACKED WOOD WOOL BETWEEN TWO WIRE MESH SCREENS
23Cm. OUTER MASONRY WALL
OPEN BRICK WORK SUPPORTS
OPENING FOR REMOVAL OF RICE HUSK
FLOW OF COLD MOIST AIR

Constructional details of the 20-tonnes potato store equipped with evaporative cooling facility.

at 10 x 10 cm spacing so that the hot air within the room can rise to the space between the ceiling and the roof to eventually escape outside.

The roof is made of corrugated GI sheets supported on wooden beams and is provided with a wire-mesh covered exhaust on the top, as shown in the sketch. There are no openings other than 11 ventilators and a 1.8 x 1.2 m door on the western side. The junction between the roof and the walls is made air-tight on all the four sides of the building. Fresh air enters the store through the moist wood-wool of the ventilators to replace the warm room air that rises through the ceiling. Solar heating of the roof maintains convection. All the outer walls are white-washed.

Potatoes are stored in bags on a 1 m high platform made of wooden beams. The bags are stacked in five tiers leaving spaces for access.

Potatoes kept in the store from the beginning of March to the end of May showed a total weight loss of about 7% and practically no rottage. A weight loss of 1% per month is considered normal in commercial cold stores. Sprouting occurred in May and the sprouts were about 2.5 cm long in the first week of June. However, potatoes treatd with the chemical chloropropham (chloroisopropylphenyl carbamate, or CIPC), at the rate of 25 mg active ingredient per kilogram of potatoes, showed no sprouting at all. The weight loss of the treated potatoes was only about 4% until the end of May.

Chloropropham is a cheap commercially available sprout-suppressant approved for use in European countries and the USA. However, it is not yet registered for use as a potato sprout suppressant in India.

A 20-tonne store of this type with a plinth area 45m2 is estimated to cost Rs. 35,000. The total cost per storage season would be about Rs. 5,000 and the net profit per year about Rs. 6000 or Rs. 30/quintal of potatoes.
Invention Intelligence 19(11-12), 1984, 441-3

147 Antibiotics prevent spoilage of cashew apples

Scientists at the Central Plantation Crop Research Station Vittal, have established that dipping of fresh cashew apples in antibiotics solution can prevent their spoilage.

A study, conducted at the institute, identified yeast responsible for the spoilage and revealed that it could be prevented if they are put in anti-fungal antibiotics solution for couple of hours and washed with water immediately after their harvesting.

With this the apples can be stored for two to three days more for their proper utilisation like in making jam, jelly, pickles and even cold drinks.
PTI Science Service 4(13), 1985, 13

148 Computer system reduces spoilage

The LifeLines computerized inventory management system monitors the freshness of temperature - sensitive products through the entire distribution chain from processing plant to retail stock room. As well as the standard package bar code, packages include a special time-temperature-sensitive polymer bar code which reacts to changes in temperature, and which can be decoded and read at any point using a battery-powered, hand-held computer. The instrument determines product identity, percentage of freshness remaining, and gives the operator

advice such as "product good", "discard now" or "ship immediately", etc. A companion evaluation system for laboratory product stability studies has also been introduced. For further details contact:Allied Corporation. New Ventures Group, P.O. Box 1021R, Morristown, N.J. 07960 U.S.A.
Food in Canada 45(2), 1985, 33-4

FOOD ADDITIVES

149 Cocoa replacer/extender

Cocoa may be replaced in cookies, cakes, brownies, ice cream, chocolate drinks, compound coatings, candies, cookie drops, and other products with Viobin Cocoa Replacer. The product is made from defatted wheat germ and 5% added carbohydrate which is pressure toasted to a rich brown. It is then ground to a fine powder which is similar in color and texture to processed cocoas. The toasting process develops aroma and taste characteristics that complement the cocoa that is to be extended or replaced. Viobin Cocoa Replacer also contributes a rich brown color to products so that food colorings do not have to be used. Texture of the final product is not changed if sufficient fat is added to compensate for that usually supplied by cocoa. For further details write to Sales Dept., Viobin Corp. Monticello. IL 61856.
Food Technology 39(1), 1985, 117

PROCESSES

150 A drink from Coconut Water

This new "Coco Drink" has been introduced in the Philippines by a team of Scientists at the Philippines National Institute of Science and Technology. While mature coconut water forms the basic raw material in this drink it is incorporated with Vitamins, Minerals and Vegetable fats to up-grade the nutritional value.
Coconut Bulletin 1(2), 1984, 59

151 Oil from chilli seeds

Studies carried out at the Oil Technological Research Institute, Anantapur show that the chilli seed contains 26% oil. The oil obtained from whole seed is dark in colour. By dehulling the seed and processing the kernel, an orange coloured oil is obtained. Chilli seed oil is rich in linoleic acid (over 70%) and has resemblance to safflower and soyabean oils.

The oil can be easily refined and bleached and the pungent principle present in raw oil removed. Snacks prepared by deep fat frying in refined chilli seed oil are acceptable. The oil can also be used in paints and soap manufacture.
Beverage and Food World, Annual 1984-5, 63

152 Mango kernel can yield fat

India can produce 30,000 tonnes of fat every year from mango kernels for use by bakery and confectionary industries.

India produces 7.8 million tonnes of mangoes yearly. Mango kernel has a fat content of six to twelve per cent on a dry weight basis according to NIN.

Fat is obtained from the kernel by solvent extraction and acetone fractionation to segregate a solid fraction.

The product, has physical and chemical properties close to cocoa butterfat.

A study of the food safety evaluation of mango kernel fat undertaken at the NIN has indicated that this fat is not only nutritionally adequate but can also be a good substitute for cocoa butter in the confectionery industry.
Beverage and Food World, Annual 1984-5, 64

BYPRODUCTS AND WASTE UTILIZATION

153 Citric acid from molasses

A cheap and simple process of manufacturing citric acid from molasses has been developed by a group of students working under a project sponsored by the Karnataka State Council for Science and Technology.

KSCST sources say that the process, known as surface fermentation, requires simple equipment and the approximate cost per kg of citric acid manufactured, using the process, is only Rs. 35.

Under the process, the molasses are first sterilised for 90 minutes at 100 C. To reduce the sugar content to 15%, distilled water is added and the solution is treated with potassium ferrocyanide, ammonium nitrate and potassium-hydrogen phosphate.

The treated molasses are next put into a fermentation chamber containing aluminium trays and are inoculated with spores of an improved strain of fungus (Aspergillus) and finally incubated at 30 C for eight days.

After fermentation, the trays are removed and washed to extract the citric acid.
PTI Science Service 4(12), 1985, 13

PROCESSED PRODUCTS

154 Long-life whey beverages

According to this the production of a flavoured beverage is made from whey acidified by a strongly acidic cation exchange resin, 450 litres of cheese whey (pH 6.3) are clarified to remove the fines, cooled to 8 C and percolated through a 30 litre bed of strongly acidic cation exchange resin, marketed under the name Duolite C 20. The resulting decationised whey with an acidity corresponding to pH 1.95 is mixed with 350 litres of untreated cheese whey at 8 C to obtain 1,000 litres of whey acidified to pH 3.55. After addition of 75 kg sucrose and 800 g apple aroma, the whey is pre-heated to 85 C sterilised at 135 C and packaged aseptically.

The results of analyses show that the finished product contained appreciably less calcium, sodium and potasium than the initial whey and was comparable in the protein content (8.65 v 9.1 g/litre); it was stable and had a mild, pleasant flavour.
Soft Drinks 39(5), 1985, 191

155 High-protein rice flour

A new, high-protein flour made from rice has been developed that could be important in fighting child malnutrition in poor countries.

The new flour is made from broken rice kernels that usually cost about half as much as whole rice.

The new product contains 25 per cent protein, compared with eight per cent for standard rice flour.

The new processing method developed at the Albany laboratory, relies on the chemical action of an enzyme from a beneficial fungus, Aspergillus oryzae, commonly used in the food industry. The method is available for commercial use.

The enzyme is added to a rice flour solution that has been heated and then cooled. After about 30 minutes, the material is filtered to separate the solids -- which contain the protein - from the liquid. The solids are dried to produce the final product.

The new rice flour has a number of potential uses but the emphasis is on children aged one to three because they are most vulnerable in a food crisis.
Beverage and Food World, Annual 1984-5, 61

EQUIPMENT AND MACHINERY

156 Grate magnets

The Magsep grate magnets are used for separating ferrous particles. The round and rectangular magnets are so designed that no ferrous particle can escape through without coming in contact with the magnets. The assembly of magnets allows easy inspection, clearing and can be used for dry and wet materials where other types of separators cannot be used. The magnet finds applications in industries such as plastic, food, drug, chemical, sugar, ceramic etc. For further details contact: Magnetic Separators & Controls, 2 K.S.A. Bldg; B.S. Road, Dadar (W), Bombay 400 028.
PFNDAI Newsletter 16, 1985, 3

157 Permanent magnetic separator

Everest Magnetics Pvt. Ltd. of Odhav (Gujarat) manufacture a drum-type device for separation of iron impurities. Made from powerful permanent magnets, the drum continuously separates iron impurities from mixtures, powders, granules, etc. It is mounted on wheels and can handle mixtures at the rate of 1 to 2 tonnes per hour. The vibrating feeder feeds the mixture on the drum evenly and prevents clogging. Applications are in foundries, scrap separation, chemical purification, quartz mineral processing, iron powder plants, cattle feed manufacturing and solvent extraction plants. For further Information write to: Premier Enterprises, L-8, G.I.D.C. Estate, Behind Water Tank, Odhav Dist. Ahmedabad, Gujarat 382 415.
Industrial Products Finder 13(5), 1985, 45

158 Heavy-duty mixer for frozen meat

Mixing machines developed for massaging frozen beef flake form are claimed by their British manufacturer to be the toughest, quickest and safest units of their type in the world. Other frozen meats such as pork, veal, lamb and turkey can also be massaged to a uniform consistency. By keeping the product frozen throughout the mixing process (in which the meat produced is subsequently deep frozen, packaged and sold as convenience food) economy and hygiene are maintained. Twin mixing scrolls (or intermeshing paddles) are on two shafts. They rotate in parallel, horizontally in a double-U trough, and

are driven by a variable speed motor. Large end-discharge doors allow quick emptying with minimum smearing. A solid-state programme controller is housed in a hoseproof cabinet and it incorporates a tamperproof adjustable mixing-cycle timer, stop/start, reverse shaft direction and discharge programme. The lid or grill is safety-switched and if opened will stop the motor. When closed again the machine will restart to complete the timed cycle. Small quantities of spice or colouring added through the grille are distributed uniformly throughout the batch.

The TSM machines are designed for ease of cleaning with all contact parts in polished stainless steel. Models with capacities up to 200 litres are mounted on castors. The 200 litre and larger models discharge direct into standard meat trolleys. A safety lock ensures that meat can be emptied only when a trolley is in place.

Options include jackets for cooling and heating, a lid suitable for vacuum duty, hydraulic loading equipment, automatic load/ discharge control, and direct steam sparging. A 30 litre pilot plant is available for trials by customers. Users include food industry, producers of phamaceutical or veterinary products. Contact: Chem-plant Stainless Ltd, Coppermill Lane, West Hyde, Rickmansworth, Hertfordshire, England WD3 2XS.

159 Vertical mixer

Jayems Parkim Pvt. Ltd. manufacture a vertical mixer for dry mixing two of more ingredients. The ingredients, which are loaded into the hopper at the bottom, are conveyed to the top by a rapidly revolving vertical screw conveyor. Mixing paddles at the top whirl the particles on the wall of mixing chamber. From here, the particles fall to the bottom, and are again elevated and whirled, until the mixture is ready. Finally, the loading hopper is swung aside, for packing the mixture. The mixer comes in 125, 250, 500 and 1,000 kg batch capacity models. It also comes in special SS models to suit the requirements of chemical, pharmaceutical and food processing industries. For more details write to: Jayems Engg. Co. Pvt. Ltd., Great Western Bldg. 130/132 Apollo Street, Bombay 400 023.
Chemical Products Finder 4(1), 1985, cover page

160 Pulse dehusker

Description: Hand operated paddy and pulses shelling machine - called grihini paddy dehusker' is a new design for paddy dehusking in which the grinder comprises of two circular stones which are placed horizontally over one another, and where the lower stone rotates and the upper one is fixed. The distance between the two grinding surfaces can be adjusted. There are thrust and ball bearings fitted to keep the system very light. It is manually operated and has the capacity to

dehusk 80 kg of paddy per hour. The broken rice grains are less than four per cent.

The bonded under-runner grinder as it is also called, is much better than the traditional hand-grinder as it is lighter. The grinding stone can be moulded with locally available stone grits and has a longer life, more production, less breakages and has an adjustable disc.

The same grinder can be adjusted for dehusking pulses and can in eight hours prepare two quintals of 'dal'.

Construction: Various parts are shown digramatically as they fit each other along with the machine after it is fitted.

Process: The paddy or whole pulse (dal) is fed through the hopper and as the handle is rotated it is displaced down in the grinding space where it is lightly abrased by the stones and is deshelled.

Approximate Price Range: The price of the grinder is approximately Rs 600 and it has a capacity to give a wage of Rs. 20 per day to two women. For further details write to: J.B. Central Research Institute, Maganwadi, Wardha, Maharashtra.
Science for Villages No.93, 1985, 9-10

161 Pulse Mill

S.K. Engineering and Allied Works have developed a dal mill which is claimed to be the latest and truly modern. The mill provides a completely automatic system of processing which takes place within the work-room. The mill comes in 0.5, 1 and 2 tonne/hour capacities. As is involved the risk of stock getting wet or damaged by unexpected rain is eliminated. The milling technology features a system of conditioning the pulse by loosening the husk in the first phase so that it (husk) is removed without any pressure or rubbing. This reduces the chances of the pulse getting powdered thereby increasing substantially the yield of dal, it is said. In the second phase, the dehusked pulse (gota) is again subjected to such a conditioning effect, that splitting (of dal) takes place easily. Air temperatures, relative humidity and stock flow are suitably adjusted by instantaneóus controls. The plant is constructed of steel to withstand rigid working conditions. For details write to:S.K. Engineering and Allied Works, Sheonagar, Bahraich, Uttar Pradesh 271 801.
Chemical Products Finder 4(1), 1985, 29

162 Pulveriser

Precision Products, Vatva, Gujarat, manufacture the Bombay Pin Mill, a pulveriser to grind a range of materials to any predetermined fineness from coarse granulation to fine powder up to 150 mesh. The grinding operation is effected through

beating, shearing, crushing and auto-collision of material. Feeding is automatic by a feed hopper with oscillating sifter and the feeding is controlled to any desired rate. Large pieces of material are fed directly in the centre of the rotor, and are conveyed to the periphery of the rotor through a series of beater plates, thus gradually reducing them to the desired fineness. Sieves of required mesh are placed round the rotor and allow the pulverised materials to be ejected into the collection chamber. Suitable for foodgrains, spices, tobacco, herbs and vegetable products, Bombay Pin Mill is available in five models. For more details write to:Jayems Engineering Co. Pvt. Ltd., Great Western Building, 1st Floor, 130/132, Bombay Samachar Marg, Bombay 400 023.
Chemical Products Finder 4(1), 1985, 43

163 Oilseed flaking mill

UMAS manufacture a heavy duty, large capacity flaking mill for various oilseeds. The all-steel fabricated machine features chilled rolls running in extra large spherical bearings, safety device for non-striking of rolls, roll pressure regulation by oil hydraulic system, electric motor and V/belt drive, differential roll speed, and a geared motor driven feed roll fitted above the machine. The machine is available in capacities up to 200 TPD and different models-UMAS SFR.4(400 x 1,000 mm), SFR.4 (400 x 1,250 mm), SFR.6 (600 x 1,000 mm), and SFR.6 (600 x 1,250 mm). For further information write to: United Oil Mill Machinery & Spares Pvt. Ltd. 704 Chiraniv Tower, 43 Nehru Place, New Delhi 110 019.
Industrial Products Finder 13(11), 1985, 125

164 Tomato sorting

Sorting and grading tomatoes manually become a tedious and time consuming job when the quantity involved is high. In such cases, the portable tomato grader sorter developed by the Division of Farm Power and Machinery, College of Engineering, Central Luzon State University, Philippines, comes handy. Further, it helps to establish a common basis between the buyer and seller in determining tomato quality in relation to scale price.

The device is operated manually and consists of five parts, the regulator, the sorting assembly, the grading assembly, the loading compartment and the receiving panels. All are made of wood and other easily available materials.

Harvested tomatoes are placed inside the loading compartment controlled by the regulator. The tomatoes roll down to the sorter then to the grader and are collected by the receiving panels.

The device made of light materials could be easily carried by two persons. The dimensions are 160 x 77 x 140 cm and the

efficiency at full opening is 56 per cent. For further details write to APCTT, 49, Palace Road, P.O. Box 115, Bangalore 560 052
Deccan Herald 19 August 1985, 15

165 A Village-size Solar Refrigerator

Broadly speaking there are two ways of using solar energy to operate refrigerators. One way is to convert solar radiation into electricity by means of photovoltaic solar cells and use the electricity to drive a conventional compression refrigerator. The other way is to convert solar radiation into heat in a thermal solar collector and use the heat to drive an absorption refrigerator. Photovoltaic converts and compression refrigerators are currently being developed for small-scale domestic use and for the preservation of vaccines in isolated areas. Absorption refrigeration systems with thermal solar collectors enjoy a wide range of possible applications which includes air conditioning, medium-scale cold storage, ice manufacturing and the same small-scale uses as the photovoltaic systems. The whole subject of solar refrigeration thus embraces a variety of solar and refrigeration technologies, all of which are active areas of research and development at the present time. However, more of the systems developed to date are economically viable because they are too expensive. Efforts are being made to improve efficiencies and bring down costs, but there is little to choose between the various types.

Experiments on solar powered refrigeration at the Asian Institute of Technology were started in 1978. They have constructed and tested in intermittent ammonia-water absorption refrigeration system with 12 flat-plate solar colletor panels having a total area of 25 square metres.

The Collectors are placed in two rows, each having six collectors. The collectors are connected together at the headers. The ammonia-water solution contained in the collectors has a volume of 338L and a concentration of ammonia 46% by weight. A liquid seal connected to the header of the second row of collectors acts as a valve to control the flow of ammonia vapour. The rectifier is a vertical tube, connected between the liquid seal and the condenser, to remove unwanted water from the vapour passing from the collectors to the condenser. It is cooled by a water jacket. The condenser is placed in a large tank of water to remove the heat of condensation of the ammonia vapour.

The refrigeration part of the system consists of an insulated cylindrical receiver storing liquid ammonia before it runs into the evaporator coils to produce refrigeration. The evaporation coils are immersed in an ice box with brine used as a heat transfer liquid between the evaporator coils and the ice cans. There are five ice cans, each having a capacity of 20L. A water tap connected to the bottom of the evaporator is used occasionally to return unwanted water from the evaporator to

the solar collectors via the liquid seal. This purging operation is performed by means of hand valves. The ammonia vapour, from the evaporator is directed by the liquid seal to the bottom of the solar collectors for reabsorption in the solution. New features designed especially for the system include a liquid seal to control the flow of ammonia vapour and a distributor to ensure the even reabsorption of ammonia in the collectors. The generation process was found to have the maximum efficiency theoretically achievable in the design used.

About 65 kg. of ice were produced on a clear day instead of 100 kg as originally expected. However, investigations showed that the full amount of ice will be attainable after redesign of the evaporator unit. An economic evaluation of the system indicates that the pay back period of a commercial unit would be two to six years, depending on interest rates and the price of ice. A version of the system designed for use in remote places could be operated by unskilled personnel.

Energy Digest 4(4), 1985, 3-4

166 Economical Cardamom Drier

This consists of insulated double tin sheet walled box of size 6′ x 6′ x 4′ resting on a 2-1/2′ stand. A fully insulated oven placed near one side of the box supplied the hot flue gas to the drier. A bottom tank, inside the drier box, receives the hot flue radiates heat to the drier. There are two double doors on opposite side in the drier. By opening these doors, 40 tray, in the drier, each tray capable of taking around 2 kg. green cardamom may be charged. On the top of the drier 4 moisture shutters are located. These are combined with the outlet flue to provide uniform removal of moisture. A tall chimney removes the moisture and used hot flue. Contact: Cardamom Planters Association College, Bodinayakanur 626 513, Tamil Nadu.
Documentation Bulletin No. 59, 1985, 12

PACKAGING

167 Vacuum Wrapper

Fesavac of Spain offer a vacuum wrapping machine suitable for packing fish, cheese, confectionery, marzipan and general food, chemical and pharmaceutical products under vacuum with the help of any flexible, semi-rigid or rigid packing material. The lower film may be polymide, polyester, polystyrene, polypropylene or PVC. The machine achieves a speed of 25 cycles/minute depending on the dimension of the wrapping, depth and wrapping material. For further information write to: Ajay & Abhay Private Limited, 84/1, Okhla Industrial Area, Phase 11, New Delhi 110 020.
Industrial Products Finder 13(11), 1985, 67

168 Horizontal Continuous Flowrap

This may be used to package bakery, fruit, vegetable, confectionery, dairy, and ice cream products. Called the Jaguar flowrap machine it features a production speed of up to 220 packages/min, and it can wrap with cellulose film, plain or peforated polypropylene, and PVC as well as with a variety of hot and cold sealing laminates of foil, paper, polyethylene, and other materials. The brochure describes the various features and lists specifications for the Jaguar unit. For a copy write to Systempak, Inc., 27W. Lincoln Hwy, Penndel, PA 19047.
Food Technology 39(1), 1985, 130

169 Sample storage bag

Storage Bag made of white Kraft paper with a laminated poly inner liner and a write-on surface is ideal for separating and storing chemical mixtures or food samples. The bag can also be used as a transit bag for sending samples to the test laboratory. A metal strip at the top of the bag folds over for secure closing, or it can be heat-sealed. The bag is oil, water, and chemical resistant. The size of the bag is 5 in x 9 in with a 3-in gusset. For more information write to Associated Bag Co., 160 S. Second St., Milwaukee, WI 53204.
Food Technology 38(12), 1984, 122

170 Filling and sealing machine

Babri Packagings offer a range of filling and sealing machines for pre-made flat or stand-up pouches. The machine is pneumatically driven with infinite controls on sealing temperature, pressure and dwell time. The range includes semi-automatic machine for edible oils, Vanaspati and ghee with outputs of 500 to 1,000 pouches per hour and fully automatic machine with outputs of 1,200 to 1,500. Auger or weigh filler can also be supplied with the system. For further information write to Babri Packagings Pvt. Ltd., B-46 Naraina Industrial Area, Phase 11, New Delhi 110 028.
Industrial Products Finder 13(5), 1985, 79

ANALYSIS

171 Fat meat analyzer

This is called Anyl-Raycan which quickly and accurately determines the amount of fat in meat samples. The unit can be used to determine lean/fat ratios in a matter of seconds. The advantages and features of the instrument are discussed in a brochure. For a copy, write to The Kartridge Pak Co., 807 W.

172 CEM Moisture/Fat/Protein System

The CEM Moisture/Fat/Protein System is designed to rapidly and automatically provide accurate moisture, fat and protein determinations on a variety of meats and meat products. The system includes the latest developments in microwave drying, computer technology and closed-system solvent extraction. The system is extremely simple to operate and requires 6-10 minutes for a complete analysis.

The CEM Moisture/Fat/Protein System consists of two instruments. The first is the Moisture/Solids Analyzer AVC-80 for measurement of moisture by rapid, accurate drying. The AVC consists of an electronic balance, a microwave drying system and a microprocessor digital computer. The second instrument is the Fat Extraction unit. It consists of an automatic extraction system (AES) and a solvent recovery system.

Moisture Determination: Utilizing microprocessor control, the AVC-80 is completely automatic and simple to operate. Simply place a sample on the balance pan, close the door and press the appropriate key. From this point on the instrument operates unattended, displaying the moisture result in a matter of minutes.

The initial sample weight is stored and the microwave system is actuated for a period of time to dry the sample. At the end of the drying interval, the drying system is turned off, the final weight, weight loss and percent moisture are displayed on the alphanumeric display.

Meat Analysis: The CEM Moisture/Fat/Protein System provides real time data for process control schemes based on least cost formulations. The system works equally well on raw meats, processed meats, pre-blends, emulsions and meat by-products. The system is simple enough to be used by production personnel as well as for laboratory analysis.

The digital computer on the AVC-80 can be interfaced with an alphanumeric printer to provide hard-copy record of the moisture/fat data. The system can also be interfaced to a central computer or other system for data storage, factoring of biases, calculation of least cost formulations, protein calculations etc.

Fat Determination: The dried sample is removed from the AVC and placed in the fat extraction unit. The unit performs a rapid solvent extraction using high-speed mechanical agitation. The undissolved material (non-fat) is automatically collected on a filter pad. The pad is then removed from the extraction unit and reweighed in the AVC-80. The computer calculates the amount of fat removed by the extraction process and displays

this as percent fat. The extraction process requires 4 minutes.

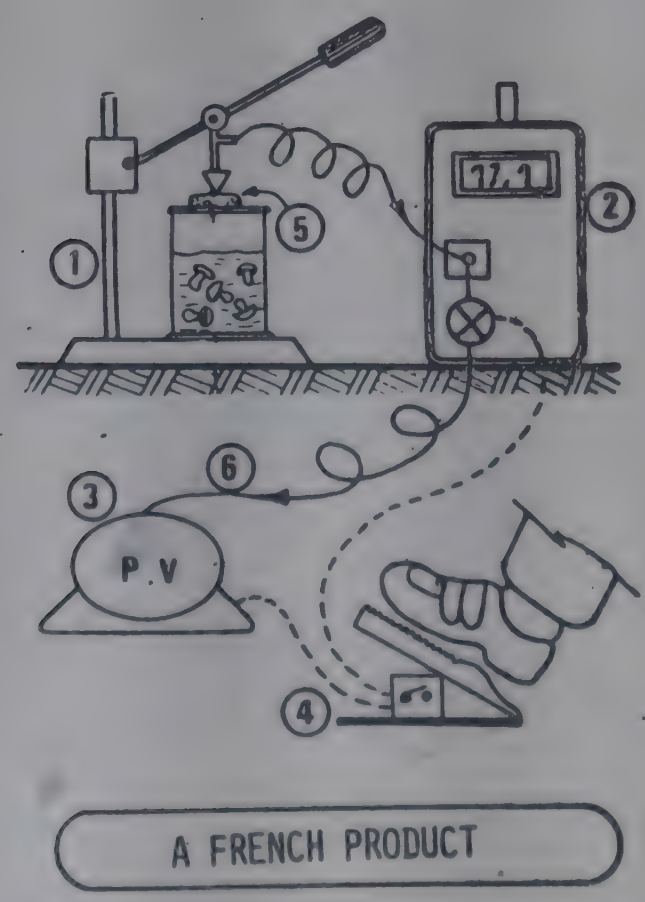
The extraction system also includes a solvent recovery unit which automatically redistils the used solvent so that it can be continually reused. This system reduces solvent usage and fumes to insignificant levels and eliminates the need for venting or waste disposal.

Protein Analysis: Once the moisture and fat have been determined for fresh meats, pre-blends or emulsions, the protein can be calculated very quickly with the appropriate formula.

Accuracy and Precision: Accuracy and precision are comparable to standard AOAC methods with repeatability of 1% (1 sigma). Nominal sample size is typically 5 grams. For further details contact: The Marketing Manager, Swadeep Instrumentation, Post Box 6740, 101, Vishnu Villa, 10th Road, Khar, Bombay 400 052.

173 Oxygen residue measurement

This is useful for measuring residual oxygen in all food packings including jars, tin cans, sachets, bottles and such other containers. Herrmann Mortz suggests a complete combination in working order which is shown in the figure 1. The stand with perforator for boxes and a needle for sachets 2. The



oxygen analyser 3. The evacuating pump. 4. The operating pedal 5. A sample of adhesive alveolatd froth 6. All the tube

joints.

The principle of working in after having created a vacuum in the oxygen analyser and in the tube connecting the packing to be tested by perforation under gas light joint of the lining of this packing, the gases are released in the tube and the sensor of the analyser. It only remains to read the partial pressure of oxygen from this released gas. The whole operation lasts for only some minutes. Details of measurement and other technical details are given.
For further details contact: Technovation, Unit A-3, Udyog Sadan 3, Opposite Seepz, Central Road, M.I.D.C. Industrial Area, Bombay 400 093.

174 Salmonella kit

Medical Wire and Equipment, have introduced a kit which they claim is simple to use, and in which a red/green colour change provides a presumptive identification.

Medical Wire & Equipment claim that careful consideration has been given to personnel safety, and that the kit is completely safe to handle - once the test has been completed, the swab is treated with a neutralising solution and can then be disposed of with other waste.

During use the plastic wrapper of the pack is peeled back to expose the caps of the two tubes it contains: the swab is taken from its tube and is wiped over the test site to obtain a sample. The swab is then placed into the culture tube, and the cap is pressed firmly down to ensure that the sample lies in the medium. Relevant data (site, time etc) is then written on the ready-fixed label, and the tube is incubated at 44 C - 45 C for 18 hours. A positive result is clearly indicated by a colour change from bright red to green. The kit contains sufficient materials for the carrying out of 50 tests.
Food Flavourings, Ingredients, Processing Packaging 7(5), 1985, 13

COMMERCIAL INTELLIGENCE

PRODUCTION (RAW MATERIALS)

75 All-India Final Estimate of Arecanut 1983-84

State	Area (Thousand hectares)	Production (Thousand tonnes) (Dried nuts without husk) (processed nuts)
Andhra Pradesh	0.2	0.2
Assam	50.2	47.9
Karnataka	56.2	82.2
Kerala	60.4	41.4
Maharashtra $	2.4	2.1
Meghalaya *	6.5	4.9
Tamil Nadu	3.9	3.1
Tripura	0.7	1.1
West Bengal	4.3	1.1(E)
Goa, Daman & Diu	1.3	1.4
Mizoram	0.4	Neg.
All-India	186.5	183.4

$ Relate to 1982-83
* Relate to 1980-81
(E) Estimated
Neg:Negligible
Agricultural Situation in India April 1985, 76

176 Statewise estimates of area and production of cardamom and black pepper, 1983-84

(a) Cardamom

State/District	Area (Hectares)	Production (Tonnes)
Karnataka	29,546	1,689
Kerala	52,129	1,941
Tamil Nadu	4,210	430
Sikkim	20,000	4,000
All-India	1,05,885	8,060

(b) Black Pepper

1	2	3
Karnataka	2,764	721
Kerala	1,03,021	22,031
Tamil Nadu	1,185	280
Pondicherry	14	6
All-India	1,06,984	23,038

Note:- The crop is not grown to any appreciable extent in States/Territories/districts not mentioned above.

Agricultural Situation in India, April 1985, 62

177 State-wise estimates of area and production of tur, 1983-84

State	Area (Hectares)	Production (Tonnes)
Andhra Pradesh	2,64,400	73,500
Assam	10,508	7,683
Bihar	91,505	1,08,284
Gujarat	2,99,600	2,05,300
Haryana	18,673	16,451
Karnataka	3,55,424	1,51,185
Kerala	212	138
Madhya Pradesh	5,13,800	4,74,500
Maharashtra	7,31,200	4,87,000
Meghalaya	1,296	1,001
Orissa	1,28,838	87,901
Punjab	39,700	35,700
Rajasthan	28,402	14,293
Tamil Nadu	1,65,060	69,690
Tripura	574	269
Uttar Pradesh	5,13,096	6,90,129
West Bengal	29,486	30,270
Dadra & Nagar Haveli	1,706	1,023
All India	31,93,480	24,54,317

Agricultural Situation in India, April 1985, 53-56

178 State-wise estimates of area and production of barley, 1983-84

State	Area (Hectares)	Production (Tonnes)
Bihar	98,035	79,132
Gujarat	6.000	9,700
Haryana	77,000	1,01,000
Himachal Pradesh	32,301	31,992
Jammu & Kashmir	9,978	6,534
Madhya Pradesh	1,66,200	1,73,800
Maharashtra	9,800	7,900
Punjab	60,000	94,000
Rajasthan	2,91,134	4,31,120
Sikkim	900	900
Uttar Pradesh	5,98,942	8,41,561
West Bengal	24,243	23,952
Delhi	833	1,036
All-India	13,76,166	18,02,627

Agricultural Situation in India April 1985, 51-53

179 Statewise estimates of area and production of soyabean, 1983-84

State	Area (Hectares)	Production (Tonnes)
Gujarat	11,000	4,500
Himachal Pradesh	498	67
Madhya Pradesh	6,15,800	4,40,300
Meghalaya	712	582
Nagaland	650	325
Rajasthan	22,620	15,565
Sikkim	4,430	3,500
Uttar Pradesh	1,57,237	1,17,369
West Bengal	285	142
Arunachal Pradesh	1,000	600
All-India	8,14,232	5,82,950

Agricultural Situation in India April 1985, 57

180 All-India final estimate of sweet potato, banana,onion and coconut 1983-84

Area:'000 hectares
Production:'000 tonnes

State	Sweet Potato Area	Sweet Potato Production	Banana Area	Banana Production	Onion Area	Onion Production	Coconut Area	Coconut Production
Andhra Pradesh	2.8	15.1	20.3	337.9	18.2	150.7	46.5	192.4
Assam	8.7	28.4	27.1	351.4	4.4	9.2	7.5	47.9
Bihar	63.1	420.0	9.4	49.0	13.0	101.0		
Gujarat	1.4	20.3	18.4	488.8	14.7	364.1		
Haryana	0.8	18.9			1.5	19.4		
Himachal Pradesh					0.5	0.8		
Jammu & Kashmir					0.3	0.6		
Karnataka	8.0	50.9	19.0	101.6	37.0	224.1	186.2	966.5
Kerala	5.0	33.3	47.9	291.8	0.4	2.7	676.4	2,694.7
Madhya Pradesh	8.7	53.6	11.0	200.1	13.5	111.3		
Maharashtra	5.6	75.2	49.3	1,227.0	56.4	759.1	11.2	61.1
Manipur	-	0.1	3.1	21.0				
Meghalaya	4.5	13.9	3.7	46.0				
Nagaland	0.3	0.8			0.1	0.4		
Orissa	59.0	399.3	18.1	180.5	42.1	378.8	23.3	97.9
Punjab	0.1	2.7			0.9	13.1		
Rajasthan	2.3	3.6			10.7	31.9		
Tamil Nadu	2.5	24.8	37.2	647.0	26.3	225.2	140.6	1,402.2
Tripura	1.5	14.9	3.4	18.6	0.1	0.2	1.4	1.7
Uttar Pradesh	44.4	387.7	0.8	10.7	22.6	262.0		
West Bengal							14.9	167.7
Andaman & Nicobar Islands	0.1	0.7	1.2	8.3			20.8	96.6
Arunachal Pradesh	0.3	1.4	0.5	1.4				
Delhi	-	0.2			0.1	0.8		
Goa, Daman & Diu							21.6	106.0
Mizoram	0.6	2.1	1.4	1.3				
Pondicherry	-	0.4	0.1	2.5	-	0.1	1.6	14.1
Lakshadweep			0.1	1.8			2.8	22.2
All-India	219.7	1,568.3	272.0	3,986.7	262.8	2,655.5	1,154.8	5,871.0

Agricultural Situation in India March 1985, 1004, April 1985, 77-79

PRODUCTION (INDUSTRIAL)

181 Sugar production

The total sugar production in the month of July 1985 was about 38,000 tonnes as against 17,000 tonnes during the same month last season. This brings the total output during the first ten months of the season 1984-85 to 60,67,000 tonnes as against 58,70,000 tonnes during the corresponding period last year.

The total closing stock of sugar as on 31.7.1985 was about 25,54,000 tonnes as against 35,80,000 tonnes on the same date last year.

Indian Sugar Mills Association, Press Release, New Delhi 110 019, 31-8-1985

182 Growth of Oilcake Processing capacity

Year	No. of solvent extraction plant	Annual Capacity (M.T.)
1981	239	64,02,000
1982	255	70,08,300
1983	277	77,83,800

Oils and Oilseeds Journal 36(7-9), 1984, 78

183 Rice bran oil production

There are 139 industrial units presently producing oil from rice bran with an installed capacity of 6,400 tonnes per day in terms of rice bran.

There is no restriction on the expansion of rice bran oil producing units, according to a press release issued here recently.

The statewise distribution of the units producing rice bran oil is as follows: (number: capacity per day in tonnes) Andhra Pradesh 33; 2,031, Assam 2; 33, Bihar 4; 111, Gujarat 4, 252, Haryana 14; 450, Karnataka 13, 783, Madhya Pradesh 88; 402, Maharashtra 4; 336, Orissa 4; 90, Punjab 20; 798, Rajasthan 2; 75, Tamil Nadu 10; 282, Uttar Pradesh 13; 519, West Bengal 6; 199, Chandigarh 1; 19, Pondicherry 1; 18, Total: 6,400.

184 Rice bran and rice bran oil statistics.

Quantity in 000 tonnes.

Year	Rice Bran Processed	Rice Bran Oil Produced			Deoiled Rice Bran Produced	Rice Bran Exports		Deoiled Rice Bran sold locally (Estimated)
		Edible	Industr.	Total		F.O.B. Value in Rs.Crs.	Unit Value per MT Rs.	
1980-81	922	4	126	130	780	29.55	576	265
1981-82	1060	10	140	150	900	33.43	577	320
1982-83	1090	265	126	1525	922	33.75	680	390

The Oils and Oilseeds Journal 36(7-9), 1984, 74

185 Soft drink sales in India 1984

	Total	Cola	Lemon	Orange	Others
Parle	320.39	146.62	95.12	65.34	13.31
Campa	131.06	101.47	10.29	17.60	1.70
Mcdowells	34.54	12.63	8.99	12.92	-
Others	65.71	21.98	14.15	14.81	14.77

The Economic Times 29 May 1985, 3

186 Citric acid

There are two units engaged in the production of citric acid-Citurgia Bio-Chemicals Ltd., and Citric India Ltd. with a total installed capacity of 6,500 tonnes per annum. A couple of small scale units are understood to be producing around 250 tonnes per annum.

The demand for citric acid for domestic consumption by 1989 has been estimated at 5,140 tonnes while the exports has been targeted at 4 tonnes. That is total demand of 9,140 tonnes is expected by 1988. Accordingly, a gap of 3,040 tonnes has been worked out for the period of 1989. Keeping in view the availability of cheap molasses in the country, India has ample potential to expand trade in citric acid.
PFNDAI Newsletter No: 18, 1985, 3-4

EXPORT

187 Processed foods export rises.

Exports of processed foods, after witnessing a decline for two successive years, have staged a sharp comeback. Exports have gone up by Rs. 61.74 crores to Rs. 265 crores during 1984-85 as against Rs. 203.26 crores in the previous year, reports UNI.

According to Processed Foods Export Promotion Council (PFEPC) sources, the rise is significant in view of sharp decline of exports in 1983-84, when exports came down to Rs. 203.26 crores from Rs. 250.94 crores in 1982-83.

The decline was due to the huge fall in exports of guar gum. The exports of processed foods were at their peak in 1981-82 at Rs. 314.27 crores of which guar gum alone accounted nearly Rs. 108.09 crores. This share came down to Rs. 16.04 crores by 1983-84. During 1984-85 the exports of guar gum went up to Rs. 24.07 crores following resumed orders from the United States.

Analysis by components shows that not a single value added item recorded a continuous rise over the years.

The products, showing a continuous rise over these years are fresh meat. Exports of meat have gone up from Rs. 3.5 crores in 1980-81 to Rs. 26.86 crores in 1984-85. Fresh mangoes and fresh onions were among other items which maintained their rise over the years.

PFEPC is hopeful of crossing its target for 1985-86 of Rs. 300 crores.
The Economic Times 23 July 1985, 2

188 Export of frozen froglegs

During 1984-85, 2,778 tonnes of frozen froglegs valued at 77.7 million were exported. This was an increase of 14.42 percent in quantity terms and 16.33 percent in value terms over the export performance over the previous year. Exports of frozen froglegs during 1984-85 exceeded the set target of 2,000 tonnes.
Economic and Commercial News 15(28), 1985, 5

189 APEDA to promote farm products exports

The Agricultural Products Export Development Authority (APEDA) was recently set up by the Ministry of Commerce to evolve a long-term strategy to push up exports of value-added agricultural items. The APEDA will provide assistance for setting up overseas warehouses, import of technology to establish

tion of products. The APEDA will have its headquarters in Delhi and will deal with fruits and vegetables, flowers, meat and meat products, dairy products, confectionery, biscuits, sugar products, honey and cocoa products, beverages (both alcoholic and non-alcoholic), cereals and cereal products, cashewnuts, groundnuts and spices in consumer packs. There will be a Board of Control consisting of 40 members, representing the Central and State Governments, Members of Parliament, trade, export promotion councils and specialists in various fields.
Economic and Commercial News 15(24), 1985, 6

190 Exports of Agricultural and Allied Products

Exports of agriculture and allied products are major source of foreign exchange earnings for India. The principal items are tea, coffee, cashew, spices, tobacco, etc. Their export performance is reviewed in the following paragraphs.

Tea

The price of tea is in the international market has registered a marked rise in the course of last two years due to a depletion of stocks and a shortfall in world tea output. In the case of India, which is now the largest supplier of tea in the world market, there has been an increase both in production as well as in exports during 1983-84 and 1984-85.

The production of Indian tea increased from 561 million kgs in 1982 to 589 million kgs in 1983 and is estimated to have gone up to 635 million kgs in 1984. Tea exports during 1983-84 amounted to 197.5 million kgs valued at Rs. 5,013.7 million as compared to 191.6 million kgs worth Rs. 3,675 million in 1982-83, thereby showing an increase of 36.4 percent in terms of export earnings.

As a matter of policy, the volume of tea exports during the calendar year 1984 was restricted to pre-announced target of 215 million kgs in order to keep domestic demand and supply in balance. The present buoyancy in tea exports is a temporary phase and cannot be expected to last long. In a traditional item like tea, the scope for any significant increase in the volume of exports appears to be limited. The future prospects, therefore, lie in increasing the share of value-added items viz. packet tea, tea bags and instant tea in country's exports. In order to encourage this, Government of India has since announced a number of measures including CCS, assistance for brand promotion and warehousing abroad.

Coffee

Exports of coffee remained more or less stagnant during 1983-84 at a level of 73,500 tonnes valued at Rs. 1,832.6 million as compared to 75,400 tonnes worth Rs. 1,842 million in 1982-83. The set-back in exports of coffee in the past two years is largely due to production constraints. In the wake of

ped to 104,000 tonnes during the crop year 1983-84 as against production of 149,000 tonnes in 1981-82 and 130,000 tonnes in 1982-83. Coffee prospects for 1984-85 are considered bright and the production during the calendar year 1984 was restricted to about 170,000 tonnes. This is expected to help in exporting coffee in larger quantities.

India continues to be a member of the International Coffee Organisation and has signed the new 1983 agreement coming in force from October 1, 1983. India has been given an effective quota of 43,424 tonnes for 1984-85 (coffee year) as against the quota of 41,722 tonnes in the previous year. In view of the prospects of bumper crop during 1984-85 season, sustained efforts need to be made to increase exports to non-member countries as well as to get higher allocation from quota countries.

Cashew Kernels

Exports of cashew kernels increased from 30,500 tonnes valued at Rs. 1,339.7 million during 1982-83 to 39,600 tonnes worth Rs. 1,566.2 million in 1983-84 indicating a rise of 29.8 percent in volume and 16.9 percent in value. These increased export earnings were possible because of a sharp increase in unit value realisation by 53 percent. USSR has practically withdrawn from the market during 1983-84 but there was a tremendous surge in exports to USA. Other countries like Netherlands, Australia and Japan also increased their offtake.

To feed the raw material requirements of the cashew industry, India imported 15,600 tonnes of raw cashew-nuts valued Rs. 141.9 million during 1983-84. The import requirements of raw nuts seemed to rise during 1984-85. Imports of raw cashew-nuts during April-September, 1984 at 13,600 tonnes (Rs. 158 million) reached almost the level of full year 1983-84. The availability of raw nuts in international market is a continuing problem. It is, therefore, necessary to raise the domestic production and procurement of raw nuts for larger exports of cashew kernels in future.

Spices

Exports of spices which had declined from Rs. 987.6 million in 1981-82 to Rs. 889.3 million in 1982-83, looked up to Rs. 1,092.6 million in 1983-84. This impressive performance during 1984-85 was the result of exports in larger quantities as well as higher unit value realisation. Both the major items of the group, namely, pepper and cardamom contributed substantially to increased exports. Other items such as chillies, ginger and turmeric also showed an uptrend. Cardamom exports had suffered a decline during 1983-84 mainly due to the fall in production. There are good prospects for 1984-85 cardamom crop and there are also indications of revival in the main consuming markets. As such, cardamom exports are expected to fare better during 1984-85.

Oil Cakes

Exports of oil cakes witnessed a marginal decline from

1.05 million tonnes valued Rs. 1,493.5 million during 1982-83 to 952,000 tonnes worth Rs. 1,462.9 million in 1983-84. Oil cakes exports were affected by the reduction in surpluses available for export following the drought, and also on acccount of strict import regulations concerning the quality of the groundnut extractions imposed by the EEC. However, in view of the increased output of oilseeds during 1983-84, exports are expected to have done better during 1984-85. In regard to groundnut extractions, a ceiling of 400,000 tonnes had been released for 1984-85. Soyabean extractions, another important item, also exhibited a better trend.

Rice

Exports of rice continued to decline sharply from 435,000 tonnes valued Rs. 1,995 million during 1982-83 to 246,000 tonnes worth Rs. 1,471.3 million during 1983-84. Earlier, both non-basmati and basmati rice used to be exported but the export of non-basmati variety had to be banned in the interest of domestic consumers. Since 1983-84, exports were confined only to the basmati variety which is allowed at a minimum export price of Rs. 6000 per tonne f.o.b. Based on provisional data, exports of rice during April-September, 1984 amounted to 76,400 tonnes valued Rs. 481.8 million as compared to 67,000 tonnes worth Rs. 440.9 million in the corresponding period of the previous year, representing a 14 percent increase in volume and 9.3 percent increase in value.

Marine products

Exports of fish and fish preparations during 1983-84 were lower at 81,800 tonnes valued Rs. 3,273 million as compared to 94,800 tonnes valued at Rs. 3,494.5 million in the previous year 1982-83. About 80 percent of Indian exports of marine products consists of frozen shrimps, for which Japan and USA are the major markets. Exports of fresh and frozen fish, which is next in importance, showed a decline during 1984-85 mainly due to production constraints. The future prospects in this line of exports, however, would depend primarily on the adequate development of production, infrastructual storage and transport facilities.

Economic and Commercial News 15(27), 1985, 5, 8-9

191 Value of India's Exports of Principal Commodities

(Rs 10 million)

Sl. No.	Items	1982-83 (P)	1983-84 (P)
1.	Tea and Mate	367.53	501.37
2.	Coffee and coffee substitutes	184.20	183.26
3.	Sugar & sugar preparations	62.35	139.86
4.	Cashew kernels	133.97	156.62
5.	Vegetables and Fruits (other than cashew kernels)	158.80	155.16
6.	Oil Cakes	149.35	146.29
7.	Spices	88.93	109.26
8.	Marine products	349.45	327.30
9.	Meat & meat preparations	80.57	68.32
10.	Rice	199.50	147.13

Note: (P) Commodity-wise figures for 1982-83 and 1983-84 are provisional and subject to revision.

Economic and Commercial News 15(26), 1985, 6

192 Exports of spice and spice-products from India during the financial years 1984-85
(Quantity in M.Tons-value '000 Rs)

Commodities	Quantity	Value
Pepper	25,328.34	5,99,610.99
Dehy. Green Pepper	79.01	4,817.81
Pepper powder	8.34	326.43
White Pepper	10.83	386.18
Cardamom (small)	2,383.25	6,48,053.15
Cardamom (big)	193.90	8,925.00
Chillies	7,151.68	85,207.60
Chillies powder	1,007.98	11,449.40
Ginger	7,320.21	1,86,953.39
Ginger powder	8.71	322.59
Turmeric	9,371.41	1,27,148.82
Turmeric powder	3,551.46	44,421.29
Curry Powder	3,122.29	38,208.08
Coriander seed	6,231.41	34,247.57
coriander powder	699.01	5,609.72
Cumin seed	3,801.94	52,730.82
Cumin powder	67.05	1,044.83
Celery Seed	1,911.84	32,442.85
Fennel seed	3,708.72	31,881.95
Fennel powder	2.58	22.24
Fenugreek seed	5,543.03	27,417.43
Fenugreek powder	1.30	7.25
Garlic	4,534.31	14,923.04
Dehydrated Garlic	510.79	9,332.58
Garlic powder	192.29	3,224.45
Cassia	347.64	5,065.94
Nutmeg	0.02	1.58
Aniseed	20.96	361.18
Tejpat	93.58	276.48
Tajpat powder	15.00	42.86
Misc. Spices	1,615.24	14,769.15
Oils of Spices	27.66	23,078.42
Oleoresins of spices	303.32	73,964.85
Total	89,165.20	20,86,276.19

Spices News Letter 19(8), 1985, Back cover page

193 Spices export touch new high

India's exports of spices and their products in the calend year 1984 registered a new high at Rs. 1,914.7 million as against R 1,620 million in 1983.

The highlight in exports during the period under review, w that pepper exports touched a new level of Rs. 611.8 million whi earnings in the previous year were Rs. 372.2 million. Turmer exports more than doubled from Rs. 83.1 million in 1983 to Rs. 183 million in the following year and quantity wise, these rose fr

9,420 tonnes to 14,164 tonnes. Another item which fetched notable earnings, was ginger which improved its exports performance from Rs. 69.1 million to Rs. 173.9 million.

Oil and oleoresins of spices contributed to the rising export trend by moving up from Rs. 47.5 million to Rs. 78.4 million.

Curry powder exports during the calendar year 1984 looked up to 3,373 tonnes worth Rs. 39.7 million as compared to 2,598 tonnes valued Rs. 29.7 million in 1983.

The following items of miscellaneous spices also showed significant step-up in their export earnings:

	Value (Rs. million)	
Items	1983	1984
Celery Seed	22.2	Rs. 33.9
Fennel seed	17.1	Rs. 34.7
Fenugreek seed	16.2	Rs. 31.0

Economic and Commercial News 15(31), 1985, 3

IMPORT

194 Imports of edible oils

The provisional DGCI and S figures reveal the following trends. Imports of edible oil which stood at 1.35 million tonnes valued at Rs. 6,252.8 million during 1981-82 dropped to 4,95,000 tonnes valued at Rs. 2,260.27 million during 1982-83. The import demand, however, again recovered to 1 million tonnes valued at Rs. 5,409.8 million during 1983-84. The upsurge in edible oils imports continued during the first half of 1984-85 when they were 6,58,000 tonnes valued at Rs. 4,253.1 million, compared to 2,90,000 tonnes valued at Rs. 1,167.5 million imported during the corresponding period of the previous year.
Economic and Commercial News 15(32), 1985, 5-6

TRADE INFORMATION

195 IIFT to open Madras chapter soon

The Indian Institute of Foreign Trade (IIFT) has decided to set up a number of chapters in the country as part of its expansion and diversification plans. The first chapter would be set up in Madras.
The Economic Times 16 July 1985, 2

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

196 Sets action level for methyl mercury in fish

FDA has changed the basis for enforcement of the action level for mercury in fish from total mercury content to methyl mercury content as a suitable analytical method for determining methyl mercury content for enforcement purposes is now available. Details are in the Federal Register of Nov. 19.
Food Technology 39(1), 1985, 51-2

197 ISI Hygienic Code for food hawkers

Indian Standards Institution (ISI) has prepared a Code which provides guidelines for food hawkers in maintaining optimum hygienic conditions. The code provides that no person suffering from any skin disease or any infectious or contagious disease should be permitted to sell food item. It provides that the hawkers should keep their finger nails short and clean and wash their hands with soap before commencing work and after each absence specially after using sanitary conveniences. Uniforms, preferably white, or aprons, and towels used for drying hands should be clean.

All the hawkers should be inoculated and vaccinated against the enteric group of diseases as prescribed by the concerned health authorities and a necessary certificate in this respect should be available with them for inspection.

According to the Code, all utensils containing articles of food should be kept in a glass case of the pattern approved by the health authorities. At no time, articles of food should be kept exposed to dust and flies. The dishes and spoons should be washed thoroughly with chlorinated water immediately before use. Unless proper hygienic norms are adopted and enforced by the health authorities, the consumption of such foodstuffs from these hawkers would be a potential health hazard to the consumers.
Economic and Commercial News 15(24), 1985, 12

198 Pollution control and plating technology

A British company specialising in the design and construction of equipment for the pollution-control and plating industries has developed a technique for recycling chromic acid in the tin-free (TFS) coating process (rapidly becoming an alternative to tin-plated steel for food and beverage containers).

Special techniques developed for the purification of the rinsewater used to decontaminate the treated steel strip permit the recycling of high-purity rinsewater into the process without temperature loss and also the separation of the chromic acid from its impurities. The chrome-separation technique

involves ion exchange, a process widely used in water treatment and now finding an application in waste and effluent treatment. These processes employ microprocessor control to determine the exact point of resin exhaustion and maximum recovery concentration.

The preparation of pre-processed convenience food (for example for airlines) gives rise to waste rich in fats and solids (a nuisance as they tend to set in the adjacent sewers causing smells and blockages often incurring expenses in excess of local authorities' charges for electroplating waste, which may be more toxic).

A recent successful application involved a British airline which was provided with a plant that uses dissolved-air flotation to separate fats (which float naturally) and fibrous solids. Heavy, non floating grits from vegetable washing are removed by settlement using the same tank. Dual scraping mechanisms on the surface and base of the tank remove the pollutants to skips semi-solids form for general solid-waste site disposal. For further details contact: Pollution Control Ltd, PO Box 404, Halesfield 20, Telford, Shropshire, England TF7 4EW

HYGIENE

199 Food Grade Grease

Multipurpose lubricant for food processing equipment will not wash out with exposure to water, unlike many food grade lubricants. Called Molykote, the grease reduces friction, prevents metal-to-metal contact, and minimizes wear. The product is designed for use on bearings, gears, chains slides and other mechanical elements of equipment. The white mineral oil grease contains an aluminum complex thickener with lubricating solids and is effective at temperatures ranging from 0 to 300 F. It can be applied by hand packing, hand operated grease guns, automatic greasing equipment, and central lubricating systems. For more information, write to Dow Corning 2200 W.Salzburg Road, Midland, MI 48640
Food Technology 38(12), 1984, 125

200 Ultraviolet water disinfection system

Ultraviolet Water Technology (Bombay) Pvt. Ltd. manufacture an ultraviolet water disinfection system in collaboration with Ultraviolet Technology, Inc. of USA. The sterilising unit provides water free of micro-organisms, by means of ultraviolet (UV) radiation, without using any chemicals. The system, which is claimed to considerably reduce both capital and operating costs, uses low pressure mercury lamps to generate UV light of 253.7 nm. Incoming water is passed through a UV transmitting fluorocarbon tubing which is placed amidst UV lamps. The non-

fouling tubing allows to regulate the flow in turbulent plug flow which increases the efficacy to the optimum level of 99.9+%, it is said. The system has no moving parts and there is complete separation of water and electrical circuits making the unit reliable and easy to maintain. Model capacities range from 3.7 to 2,250 LPM; but models up to 30,000 LPM can also be offered. Applications are in food processing industry, pharmaceutical plants, breweries, disinfection of waste water effluents, etc. For further details contact: Ultraviolet Water Technology (Bombay) Pvt. Ltd. 107 Maker Chambers III, Nariman Point, Bombay 400 021.
PFNDAI Newsletter 16, 1985, 2

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

201 Feni units in State

Two modern cashew distilleries to manufacture feni will be established in Karnataka in the near future, according to Dr. L. Krishnaswamy, Joint Agricultural Marketing Adviser.

Tenders have been called for to construct one distillery near Puttur in Dakshina Kannada District, while a location for the other is yet to be decided, Dr. Krishnamurthy told newsmen here today. The Karnataka Cashew Development Corporation would be setting up the distilleries which will have a capacity to crush about 600 to 1000 tonnes of cashew fruits each every season.
Deccan Herald 15 August 1985, 3

202 Fast food enters India

The fast food chain of Wimpy International, UK is now entering India. The UK company has given the franchise to Wimpy India for making and marketing food items under its brand name.

The Indian company, a joint venture between an NRI and a local Indian, proposes to set up a chain of food outlets in Delhi.
Beverage and Food World Annual 1984-5, 61

203 New pineapple processing unit

APV-Texmaco Ltd., a subsidiary of APV Holdings Plc of UK, will be setting up India's first automatic pineapple processing plant in Assam, in collaboration with Modern Food Industries Ltd., a Government of India undertaking.

The Rs. 120 lakh project, which is stated to be completed by the first quarter of 1986, will be handled on a turn key

basis by APV.

Mr. Sujit Chakravarty, managing director, APV Texmaco Ltd., said the plant was being set up in Silchar in Cachar, a no-industry district in Assam, which was abundant in pineapples. The plant, when fully operative, would be able to handle 15,000 pineapples per hour at the input end, converting them into concentrated juice.
Beverage and Food World Annual 1984-5, 61

204 Tri Star Soya Products expansion programme

Tri Star Soya Products Limited will be doubling its soya processing capacity to 400 tonnes daily and that of refined oil to 26,000 tonnes annually at a cost of Rs. 3.64 crores. The earlier project for establishing facilities for handling 200 tonnes of soyabean daily and refining 10,000 tonnes of oil yearly was delayed because of a mishap in 1983. The complex in Maksi, however, commenced commercial production in October last year. It has been estimated that the turnover upto June 15, 1985 will be Rs. 11.60 crores and the profit Rs. 1.07 crores. The expansion scheme is scheduled to be completed by the end of this year. As there is a good demand for soya meal in export markets and for refined oil within the country it is also the intention to implement other schemes for producing value added soya foods at a later stage.
The Hindu 23 July 1985, 13

205 Registrations with DGTD

Following is the list of schemes registered with DGTD.

Seven Star Food Prd (P). Ltd,
183, Gandhi Road
Tizupati 517 501, AP
Vermicelli noodles macroni-long and short - 14, 400 t.

Kruti Marketing Ltd.,
Rangawala Tower
Behind Law Garden
Ellis Bridge
Ahmedabad - 6
Refined rice bran oil - 7,500 t.
Fatty acids (By Prod.) - 7,500 t.

Varuna Marine Products P Ltd.,
D-37, Panchsheel Enclave
New Delhi 110 017
Vegetable oil by solvent extraction process - 75,000 t;
refined vegetable oil - 75,000 t.

Paras chemicals Ltd,
G.T. Road
Jandiala Gura

Dist. Amritsar
Punjab
Vegetable oil by solvent extraction process - 25,000 t.

Kashmir Refineries P Ltd.,
Soura House
Soma, Jammu & Kashmir
Refined vegetable oil 15,000 m.t.

Allana Cold Storage P Ltd
4, J.A. Allana Road
Colaba, Bombay 400 039
Frozen meat - 16,000 m.t.
Frozen marine prod. - 3,500 m.t.

Flexo Firms Wraps (I) Ltd.
D2/D3, MIDC Indl. Area
Chiralthana, Aurangabad 431 210
Food wrap films (tain 0-013)
made from polyvinyl chloride - 720 t.

City Drinks P Ltd., 7 Station Road
Bangalore
Soft drinks - 96 million bottles

Wallace Flour Mills Co. Ltd.
9 - Wallace Street, Fort
Bombay 400 001
Snack foods such as potato chips, nuts etc, convenience foods such as pizzes, French fries etc. 4,000 t.

Maharashtra Agro Industries. Dev. Corpn Ltd.
Rajan House, 3rd Fl.
Prabhadevi, Bombay 25
Squashes, syrups, tomato ketchup, Jam etc. 2,400 t.

Surya Agroils Ltd.,
208, Akash Deep
26-A Barakhamba Road
New Delhi
Vegetable oil by solvent extraction process -
90,000 m.t.
Refined vegetable oil - 20,000 m.t.

Central India Soya Prod Ltd
E-3/27, Arera colony
Bhopal
Soya Flour (cooked) - 8,000 t.
Texturised soya/cereal products - 5,000 t.

Raipur Flour Mills (Unit No.11)
Fafadih, P.B. No.5
Raipur, MP
Pasta products; i.e. vermicelli, noodles,
spaghetti, macaroni and other similar prod.- 75,000 t.

Raja Ram & Brothers (Refinery Div)
Mhow - Neemuch Road,
Mandsaur MP 458 001
Refined vegetable oil - 3,000 t.

Vinod Kumar, 51-A, Chambers Road,
R.A. Puram,
Madras 28
Soft drinks - 96 million bottles

Falcns Beverage (I) P Ltd., 3-Jambahalinga
Nalchen Street, Nungabambakkam, Madras
Soft drinks - 27,648 m bottles

Sarojini Solvent, 3-113, Jalandhangi Street,
Yanam, Pondicherry
Vegetable oil by solvent extraction process
45,000 m.t., refined rice bran oil 6,700 m.t.

R.C. Gupta, Room No:13 (1st Fl), Sulizi Market,
Cowk Hauz Qazi, Delhi 110 006
Soft drinks - 96 m bottles
Financial Express 28 July 1985, 3

PERSONALIA

Nil

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RAW MATERIALS

206 Egg-expensive protein source

Eggs as source of protein are costlier than milk and cereal-pulse combinations.

One egg costing 75 paise is equivalent to 100 ml of milk which costs 55 paise and a suitable cereal-pulse combination which costs 15 paise, in terms of protein content of four grams present in each, according to Dr MC Gupta, president, Institute of Health and Nutrition.

He told PTI Science Service that a combination of cereal protein and pulse protein in the ratio of four to one gives an overall protein quality matching that of high class proteins in milk and egg.

Gupta also said that boiled egg is safer than a raw egg which may have infection in it apart from the presence of some anti-nutrients.

The white portion of the raw egg contains 'avidin' which inhibits formation of 'biotin', one of the B group vitamins. People with 'biotin' deficiency may develop dermatitis, he said.

Eggs obtained from chickens under antibiotics treatment, usually resorted to in India, should not be used as they may lead to antibiotics resistance in human beings.

Egg yolk contains high cholesterol and should not be eaten by persons having coronary heart diseases, who may already have a high cholesterol level.
PTI Science Service 4(18), 1985, 8-9

207 Asparagus varieties introduced

The scientists at the Regional Research Laboratory, Jammu, have successfully introduced 30 varieties of Asparagus from different countries during last 5 years. The successful introduction may help in development of agro-technology to facilitate commercial cultivation of asparagus in the country.

They have identified the varieties best suited to agro-climatic conditions of Kashmir valley and released them for commercial cultivation to the growers. As a result of these efforts more than 30 growers have been involved in asparagus cultivation with the seed and seedling provided by the laboratory. It has been worked out that the yield per hectare is more than 2,70,000 spears valued at Rs. 40,000 after the third year of its growth.

The laboratory is presently continuing its effort to introduce more varieties from different sources all over the world for screening as well as developing better varieties in terms of quality and yield, by employing various plant breeding techniques.
PTI Science Service 4(15), 1985, 16-17

208 Fruit-ripening process retarded

A team of Australian researchers will examine the use of calcium to slow down the ripening and aging process in fruit and vegetables after harvest.

The fruit-ripening project, led by Ron Wills, will examine the use of calcium to improve the quality of fruit and vegetables after harvest. It has been known for many years that browning and pitting in fruit and vegetable stem form lack of calcium in the produce, but no method was available to add the amount of calcium needed to prevent their occurrence.

Wills and K.J. Scott of the NSW Department of Agriculture, developed a vacuum infiltration method of dipping apples after harvest which can introduce enough calcium into the fruit, eliminating the disorders without damaging the produce.

Studies have found also that the method can delay the ripening of a range of other fruits without refrigeration. The treatment has potential in tropical countries which do not have the technical infrastructure to refrigerate fruit but could apply a simple dipping treatment.
Cardamom 18(8), 1985, 17

STORAGE AND INFESTATION CONTROL

209 Pusa's improved bamboo basket

This structure comprises of a pair of round bamboo baskets with flat bottom (average dia 82cm) and depth (42cm) having storage capacity of 70 kg grain. They are painted with coal tar on both the sides. The sides are plastered with mud and cowdung (3:1) paste and dried. A polythene bag from 700 guage thick film with 97 dia and 100 cm depth is prepared by heat sealing. One of the baskets with smaller dimension is inserted inside the polythene bag. This is then lifted from the top and placed inside the second basket. About 50 cm of polythene remains uncovered and is tied after filling of grain. The structure is then covered with a lid and is placed on a 45 cm high wooden or bamboo platform to safeguard against damage. Further information can be had from the Indian Grain Storage Institute, Hapur, U.P.
Documentation Bulletin No: 60, 1985, 11

210 Improved storage method for apples

The new storage technique developed by Knee and Colin Dover a Physicist at East Malling, Research Station, Kent, Southeast England, delays the onset of ripening of apples by continuously removing ethylene from the atmosphere in which fruit is stored. After preliminary trials they designed an ethylene removal system (an ethylene 'Scrubber') for use with the station's 20-tonne stores. The apples remained in good condition for almost 11 months.
Documentation Bulletin No: 60, 1985, 14

211 Field rats exterminated by liquid nitrogen

Dr. M. Ohtsu of Yamagata Prefectural Forestry Experimentation Station, has developed a method for exterminating rats using liquid nitrogen.

When liquid nitrogen is poured into a rat hole, the oxygen available in the hole is reduced and rats suffocate quickly.

Extermination procedure is as follows: First the measuring cup is put on the rat hole. Next LN2 (300-500 ml) is poured into the cup and the cup is closed.

Before closing the cap, the ball is working as a valve. At the same time as closing the cap, the tension of the chain becomes loose and opens the hole. So that the LN2 drops and changes into gas.

And GN2 (gas nitrogen) is poured into the rat hole it excludes the air in the hole, as the liquid nitrogen evaporates to nitrogen gas having 646 times the volume to push out air in the hole.

As the density of oxygen in the hole decreases, rats suffocate quickly. At this time oxygen density in the hole is 2%.

As for the rat, 100% deaths occur when oxygen is 5% in the hole. 300-500 ml LN2 per hole is necessary to exterminate rats.
PTI Science Service 4(19), 1985, 19

FOOD ADDITIVES

Nil.

PROCESSES

212 Fruit flavoured whey

Whey drinks flavoured with fruit preparations, such as apple, passion fruit, mango and peach/passion fruit have been developed in West Germany (H.J. Klupsch. Deutsche Milchwirtschaft, 1984, 35(43), 1651).

Another new drink also from W. Germany (patent applied for) is made by fermentation with bifidobacteria. The pH of the whey is adjusted to 4.7, either by mixing sweet and acid whey or by souring sweet whey, increasing the solids content by evaporation or addition of dried whey, heating to destroy the microflora and inactive rennet residues, cooling and inoculating with a pure high active culture of a bacterioum such as **Bifidobacterium longum.** Suitable fruit flavourings may be added. Finally the product is aseptically packaged and stored.

The aim of the process is to obtain a beverage with a high content of L (+)- lactate and having a mild, balanced flavour, long storage life (at least six weeks), and a high content of viable bifidus bacteria throughout the storage life.

Another type of refreshing whey beverage of long storage life is produced from whey with added stabiliser by a process involving pasteurisation, incubation with a starter culture, addition of fruit and sugar, homogenisation and heating to, for instance, 120 C.
Soft Drinks 39(4), 1985, 152

213 Meat textured food

Biotechnology Australia Pty. Ltd., has developed Nutrinex HN, a new vegetable based food product, characterized by its unique cooked minced beef-like texture and appearance and bland flavour.

The product, contains up to 48 percent of crude protein and 8 percent total fat.

The process involves the following stages. An amyloytic fungus is grown on a moist starch-based substrate which includes a nitrogen source assimilable by the fungus, the substrate being provided in the form of small, partially gelatinized particles.

During growth, the fungus degrades and utilizes a large proportion of the starch, resulting in a dense matrix of closely interwoven mycelia, randomly dispersed with substances containing the residual starch or starch degradation products.

On the denaturation of the fungal mycelium, the product

assumes a tough but resilient texture and when diced or minced, has a similar appearance to meat.

Nutrinex HN has been shown to satisfactorily replace 30 to 50 percent of meat in all the preparations such as meat pie, meat loaf, meat balls, sausage roll, pizza topping, hamburger patty etc., and in some cases, with appropriate formulation, up to 100 percent of meat.

The product can be made in grades with differing protein contents, particle shape and size, texture, flavour and rehydration capacity.
PTI Science Service 4(21), 1985, 24-25

214 White pepper powder

The Regional Research Laboratory of Trivandrum has developed a process of obtaining white pepper powder from black pepper by dry grinding. The processing is done at a dry state so much so the black skin is separated and can be used for oleoresin extraction. The process essentially consists of cleaning and conditioning of dry black pepper to set an optimum product with acceptable colour, yield etc. It is then followed by grinding in a Specially designed mill. Size separation is carried out by sieving till satisfactory white pepper powder of requisite micron size is obtained. The ground material is mixed uniformly to disperse properties like volatile oil, pipeline, etc. evenly. The product is packed in air tight containers to protect it against moisture and further decay. The advantage of the process is that, while regulating the percentage to be extracted, the skin portion can be used for making oil and oleoresin. For further information write to: National Research Development Corporation of India 20-22 Zamroodpur Community Centre, Kailash Colony Extension, New Delhi 110 048.
Industrial Products Finder 13(Annual No.), 1984, 19

215 Phenylalanine production

Reading from Japanscan we learn that Kyowa Hakko Kogyo in Japan, has developed a new method of producing phenylalanine, the ingredient of the new aspartame sweetener. Biotechnology is involved and the new system involves implanting in the gene of the enzyme involved in producing phenylalanine by recombinant DNA techniques.
Food Trade Review 55(6), 1985, 292

216 Pectic enzyme/pectinase/production

In the citric acid surface fermentation of molasses media using Aspergillus niger strains considerable quantity of pectic enzyme first of all poligalakturonase, are formed. This enzyme as exogenous is contained in about 90% of fermentation liquid.

After pretreatment and precipitation of calcium citrate in the special way, effluent after filtration, which in normal process is sewage, is treated on selected ion exchange columns in order to decolorize and demineralization. Effluent from column is concentrated 10-12 fold in the vacuum evaporator in temperature below 40 C.

The obtained product has dark brown colour, syrup consistency and pectic enzyme activity about 120 PKU/International units/ or 50000 - 60000° PM/Polish units/. During one year period of storage the activity of enzyme was constant. Obtained enzyme preparation can be used to clarification of wine, fruit and vegetable maceration, as a feed ingredient etc. The cost of pectic enzyme obtained as a by product in citric acid production was considerably lower than pectic enzyme produced as main product. For further information contact: Institute of Technology of Chemical and Food Industries, Academy of Economics, Komandorska 118/120, 53-345 Wroclaw/Poland.

217 Conversion process for sugar industry

An Australian microbiologist has found a way to convert sugarcane juice to the fuel ethanol and the sugar alternative fructose, in a process which could boost Australia's sugar industry.

Ethanol, or fuel alcohol, could offer an alternative fuel source pending the sale of lead-free petrol in Australia, and diet food manufacturers could provide a ready market for fructose as a low-calorie alternative to sugar.

The microbiologist, Dr. Horst Doelle, of the University of Queensland, has proved the process, called Sucrotech, in the laboratory. He now hopes to develop it to the commercial stage to provide new marketing opportunities for Australian sugar farmers.

He said converting sugarcane or sugar beet juice to fuel alcohol for use in making lead-free petrol was not new. But it had so far proved expensive and this, combined with the fact that as much as 1½L (2.6 pints) of alcohol is equivalent to 1 L (1.76 pints) of petrol, added to the cost of lead-free petrol.

Sucrotech's success was based on his discovery of how to offset the cost of producing fuel alcohol by using the same sugarcane juice to produce fructose, a high-value, low-calorie product 1.7 times sweeter than sugar, he said.

Eventually, he hopes to improve and diversify the process to include the manufacture of by-products such as vitamins and health foods, thereby increasing Sucrotech's cost-effectiveness.

no other research team was known to have succeeded in converting sucrose to fructose and ethanol in the same batch-fermentation process.

"Fructose syrup made from corn is used extensively in the United States for making diet sugar, low-calorie soft drinks and chocolate, but the Australian Government has embargoed its import to protect the country's sugar industry," Dr. Doelle said.
Chemical Age of India 36(2), 1985, 289

218 Method to reduce milk's water content developed in Australia

A method of reducing the water content of milk to save transport costs has been developed by the Victorian State Department of Agriculture and Rural Affairs.

The method is known as reverse osmosis. Milk is put under a pressure of from 3000-4000kPa (435-580 psi), causing water to be forced out through a polymer plastic membrane.

The concentrated milk can be used for other products or made normal by adding the 60 per cent of water removed by reverse osmosis.

Researchers at the department's Gilbert Chandler Institute of Dairy Technology have been working on the method for two years.
University News 23(28), 1985, 44

219 Technology for texturised vegetable proteins (TVP)

A new soy protein food process to prepare meatless dishes with texture and chewiness resembling that of meat but higher in protein contents and 98% fat free is offered. No cholesterol and no preservatives. Low calorie and low fat desserts prepared with 'cream cheese analog' containing soy proteins. Limitless possibilities of preparing dishes. Contact: Dr. C.P. Stephen, Sopro Foods Inc., 111 West Avenue, Allion, New York 14411, U.S.A.
PFNDAI Newsletter No: 37, 1985, 1

220 Water sterilisation without chemicals

In recent years we have become so ecologically minded that the use of chemicals in foodstuffs and raw materials like water is being avoided to an ever increasing extent. Innovation and technical progress have made possible the construction of ultraviolet equipment for the reliable sterilisation of water without the use of chemical reactants. Whereas for a long time only small volumes of water could be treated with ultraviolet rays, today plants can be built for sterilising the water in large municipal waterworks. The use of compact Holzli KG Uvau-

des ultraviolet sterilising plants keeps the outlay and operating costs far below those using chlorine and ozone. Apart from that the water thus sterilised remains unchanged in taste. Another field of use is the sterilising of production process, cooling circuit and waste water. The big advantages of the Uvaudes plants is that they operate on the continuous thruflow principle without dwell times, which means that no harmful overdosage of ultraviolet radiation can occur. The advanced design, in conjunction with up to date control technology, ensures low maintenance operation. For further information write to: Holzli KG, A 4863 Seewalchen, Austria.
Industrial Products Finder 14(2), 1985, 22

221 Enzymatic meat recovery from bones

Efficient use of meat containing by-products from abattoirs and meat processors sometimes represent a problem. Bone may contain up to 5% meat by weight which it is difficult or costly to recover mechanically. As an alternative, an enzymatic process is worth considering.

The bones are crushed, slurried in water in a heatable container fitted with an agitator and possibilities for emptying through the bottom. The neutral protease, neutrase is added and the slurry heated to and kept at 60 C for 3-4 hr under careful agitation without formation of fat emulsion. Alternatively, the crushed and slurried bones are heated to and kept at 95-100 C for 15 min without addition of enzymes. The slurry is then cooled to 60 C, the enzyme added and the slurry kept at 60 C for 30 min. as the denaturing effect of the preheating reduces the necessary time of hydrolysis. The process releases the meat from the bone and the meat slurry can be recovered through the bottom of the container. Most fat will be absorbed to the surface of container and bone. The enzyme may be inactivated by pasteurisation of the slurry for 15 sec at 98 C. The gravy-like product may be used directly, e.g. as a gravy in canned meat products or soups. Further inquiries can be made to Mr J.H. Baker of Novo Laboratories Pty Ltd, 43 Hunter Street, Parramatta, NSW 2150.
Food Technology in Australia 37(3), 1985, 102

BYPRODUCTS AND WASTE UTILIZATION

222 Animal feed from groundnut shell

Groundnut shells, discarded as useless till now, can be converted into a valuable animal feed using a simple biological conversion process. A microbiologist at the University of Georgia, USA, Dr. Thomas Kerr has identified the right kind of microbial species of arthobacter that can do the job effectively. The bacteria has the ability to use the shells as a

source of food. When a few more nutrients are added and finally reduce the shells to a crumbling powder resembling ground coffee. Instead of acid treatment, the shells can be retted and fermentation could be done at the farm level.
Documentation Bulletin No: 60, 1985, 14

223 Fuel from agricultural waste

AEIL have developed the Agburn, a high heat yielding solid fuel manufactured from agricultural waste, with a calorific value of about 4,500 kcal/kg, and ash content around 10%. The size of the fuel briquette is 90 mm dia x 15 to 300 mm length. The fuel is suitable for industrial and household uses, hotels, brick kilns, etc. For further information write to: Alternative Energy Industries Ltd. 13 Community Centre, East of Kailash, New Delhi 110 065.
Industrial Products Finder 13(12), 1985, 4

224 Fish drying by agrowaste

A low cost fish dryer, using coconut husk, firewood or rice husk, as fuel, has been developed at the College of Fisheries of the University of the Philippines in Visayas. The dryer is a vertical tray type dryer with a capacity of drying 60 - 100 kg of wet fish. The cost of construction excluding labour comes to about US $ 185-205. It is divided into 3 parts: the heating compartments, the drying chamber and the dryer hood.

The housing is made of 10 cm hollow blocks and the inside dimensions are 0.90 x 1.20 x 0.85 m. It is provided with 9 air vents with sliding doors at the base of the housing. The firing tube for coconut husk and firewood is closed at the rear end and provided with grill and a damper. Two smaller tube branches from the firing tube meet, and lead to an outside movable exhaust tube.

A rice hull burner made of concrete can be connected to the firing tube if rice hull is used as the fuel. The heating compartment and the drying chamber are separated by a corrugated galvanized iron sheet heat guard which provides a 20 cm opening for hot air towards the baffles. Another heat guard made of plain G.I. sheet is located between the branching firing tubes and the first heat guard to equalize the temperature distribution in the drying chamber.

The inside dimensions of the chamber are 0.90 x 1.20 x 1.95 m and it is a double walled fibreboard chamber. It is vertically divided into 3 compartments. Hot air enters through the 20 cm baffle compartment. The baffles are made of G.I. sheet mounted on angle bar frames. The spacing of the baffles should be exactly 2, 4 and 14 cm. Hot air goes horizontally to the drying compartment which holds 25 drying trays, and leaves through the 10 cm compartment opening at the top leading to the

dryer hood.

The ventilator is used in areas where moderate wind prevails. The L-shaped hood can be used even at zero wind velocity. During operation, the temperature can be adjusted by opening or closing the air vents so that the optimum drying temperature of 55-60 C can be achieved.
PTI Science Service 4(20), 1985, 27-28

225 Conversion of lignocellulose to food, fuel and chemicals

A microbial process for conversion of all the three components of Lignocellulose, a plant biomass, into more useful products has been developed by researchers led by Prof V.R. Srinivasan at the Department of Microbiology, Louisiana State University, USA.

Lignocellulose consists primarily of three components - cellulose, hemi cellulose and lignin - which are polymeric and intimately associated with one another at the molecular level in the formation of the cell wall. Plant biomass plays an important role as feed stock in both food and animal feeding industries. Besides, a large amount of forestry residues, agricultural wastes such as rice straw, wheat straw and sugarcane bagasse are produced in large quantities and are available as starting material for cellulose based technologies.

The process developed converts all the three components of the lignocellulose to useful products. Studies on production of single cell protein (SCP) were carried out using bacterial degradation of cellulose by 'cellulomanas sp.' isolated from the sugarcane fields.

A fungal fermentation of pretreated cellulose with a thermotolerant organism called **Aspergillus terreus** was also carried out. These investigations led to a systematic approach to optimisation of growth parameters of micro-organisms in general and to development of a technique termed 'gradient-feed' for growing micro-organisms rapidly to high cell densities in laboratory fermentors.

Srinivasan said continuous production of biomass from cellulose with 80 to 85 per cent utilisation of the substrate was achieved using '**Asperigillus terreus**'. The group has also developed a novel method for screening lignin degrading micro-organisms and has isolated a lignitype strain of Erwinia. The gene for one of the enzymes for the bacterium has been cloned and expressed in E.coli. The development of a biocatalyst for specific cleavage of aryl-ether bonds in lignin would enable maximisation of production of aromatic compounds and methanol from lignin.
PTI Science Service 4(18), 1985, 32

PROCESSED PRODUCTS

Nil.

EQUIPMENT AND MACHINERY

226 Humane method of killing of frogs

The effectiveness of electrocution method demonstrated by College of Fisheries, Mangalore on humane way killing of frogs was evaluated.

The conclusion arrived at was that the electrical stunning method demonstrated, in principle, was found rather satisfactory. But, the prototype needs further modifications particularly with reference to safety precautions. Since the present equipment can handle only 100-200 frogs in each operation and the industry is handling approximately 10,000 to 30,000 frogs per day the equipment has to be re-designed in such a way to handle 400-500 frogs in each batch. For this CIFT and College of Fisheries, Mangalore may jointly do research work on this and finalise the same within a month and MPEDA may extend all financial facilities required after which the equipment can be made available commercially for supply to the exporters with financial assistance of MPEDA if deemed necessary.
Seafood Export Journal 17(6), 1985, 29

227 Squeeze out that extra drop

The first full-scale commercial plant to use a new food processor, called a counter current extractor, for producing fruit juice has obtained significantly higher yields of juice than by conventional juicing.

The extractor was built by Bioqui Austrália Pty. Ltd., based on a design developed by Dr Don Casimir of the CSIRO division of Food Research, NSW and Mr Tim Lang of Howden Equipment Services.

The new extractor is simpler to manufacture and can be operated around the clock. Moreover, since there is no intensive milling step, the extractor outperforms conventional pressing equipment in energy efficiency and its heat recovery system minimizes energy losses.

Simultaneously, a counter current of hot extracting liquid flows down the trough. The liquid extract is collected at the bottom and the solids are discharged at the top end.

Dr Casimir summarizes possible applications of the extractor as:

- extraction of juice from apples, pears, grapes and prunes and of soluble products including anthocyanin, pectin, carageenan, gelatin, malt extract, protein and fish extracts;

- impregnation of pickling olives, candying peel, crystalizing fruit and enzyming.

PTI Science Service 4(21), 1985, 23

228 Equipment for the extrusion cooking of cereals

'Flaked and Expanded Cereal' is the title of a 4-p brochure describing extrusion cooking technology and equipment for the production of flaked and expanded cereal products. Topics covered in the brochure include energy costs, raw materials, overhead and running costs, and product development through the use of twin-screw extruders. For a copy of the brochure, write to Simon Food Engineers Ltd. P.O. Box 31, Stockport, Cheshire SK3 ORT, England.

Food Technology 39(9), 1985, 110

229 Viscometers

Somani International Corporation, exclusive representatives of Ravenfield Designs Ltd., U.K. offer Ravenfield Designs Wide Range Viscometer Model B.S.

This may be supplied, fitted for Cone and Plate, Parallel Plate, Cylinder or Taper Plug geometry (for very high shear rates), and a model is available which can accept any of these geometries.

The basic Model B.S. has a speed range upto 4000 rpm and other models expand this speed range. The torque measurement range of the machine from 2 to over 2000 gm. cm. covers a very wide range of shear rates and viscosities.

Typical limit figures for the range of the basic Model B.S. are:-

The speed control of the Model B.S. is versatile and can be programmed for a range of alternatives, including ramps, steps, fixed speeds or a combination of these.

The speed range of 500:1 is covered in a single span with no gear changes. The read out is in digital form and is normally calibrated in torque, direct in gm. cms.

This instrument is suitable for use with Oil, Paint, Inks, Pharmaceuticals, Cosmetics, Foodstuffs and even such materials

as Concrete and Cement.

Another Ravenfield Viscometer is the OSCAR. This was originated by ICI and designed for production by Ravenfield.

OSCAR measures the viscosity of a substance in a sealed container by oscilating it about a vertical axis and it measures simultaneously the viscosity and visco-elasticity of a wide range of materials.

Typical limit figures for the range of the basic Model B.S. are:-

Max. Viscosity
60 centipoise
300 poise
300,000 poise

Min. Viscosity
0.2 centipoise
10 centipoise
75 poise

Shear Rate
2×10^{0} sec-'
4000 sec-'
5 sec-'

Initially offered for use with 250 ml press top tins, OSCAR can be adapted for other sizes of container providing only that the containers are cylindrical and flat ended.

Of particular value is the fact that thixotropic gel structures may be measured without damaging them. It is also possible to estimate the amount of setting of any solid phase contained on it. For further details contact: Somani International Corporation, 1510, Maker Chambers V, Nariman Point, Bombay 400 021.
Chemical Age of India 36(2), 1985, 295

230 Densitometer developed by Sarasota

Sarasota Automation Ltd of King's Worthy, Winchester, Hants S023 7 QA have developed a new liquid density meter designed for hygienic applications.

All wetted parts of the new instrument are made from corrosion resistant stainless steel with a food grade nitrile liner fitted to the stainless steel bellows. A smooth bore, non obstructed flow path eliminates the risk of contamination and allows the measurement of almost any product used.

Resistant to shock and vibration, the new meter, known as the Sarasota FD 830, has a negligible viscosity effect.

The FD830 has a very fast dynamic response, measured in milliseconds, and with an integral platinum resistance thermometer, it will automatically compensate for temperature variations and provide online temperature and specific gravity measurement.

The measuring technique of the new device uses a thin walled tube which is maintained in transverse oscillation by an electro-magnetic circuit. The frequency of oscillation produces a signal relative to the density of the product within the vibrating tube.
Food Trade Review 55(3), 1985, 127

231 Bread-slicing machine

Daub-Verhoeven offer a bread-slicing machine with what is claimed to be a unique slicing action achieved with blades and alternately at angles of 60° and 120°. This means that the bread suffers little deformation; there is a little friction when cutting into the bread, so that loaves can be sliced while they are still warm; the blades are used over a great length, so they do not quickly become blunt; and a high slicing speed per blade of 45 to 50 metres/minute is achieved. The machine has two separate crumb drawers so that the usable scraps and crusts are trapped separately from the crumbs which pass through the machine section. The machine measures 740 l x 1,540 b x 1,175 mm h, weighs 74 kg and is driven by a 0.37 HP motor. The standard slice thickness is 11 mm, but the machine can also be supplied optionally for slice thicknesses of 9, 10, 12 and 12.5 mm. Loaves with maximum length of 400 mm can be sliced in this machine. For further information write to: Daub-Verhoeven B.V. Postbus 51, 5050AB Goirle, The Netherlands.
Industrial Products Finder 13(12), 1985, 9

232 Steriliser

Stericlaves offer a range of sterilisers for hospitals; laboratories; and pharmaceutical, food and chemical industries. The stainless steel autoclave features a pressure guage, foolproof safety valve set at a desired pressure and quick release valve fitted with cool bakelite handles for use on any effective heat source. The vertical autoclave has an SS chamber and jacket so that dry steam can penetrate the sterilising chamber. For further information write to: Stericlaves 16-A, Singh Industrial Estate No.1, Ram Mandir Road, Goregaon (West), Bombay 400 104.
Industrial Products Finder 13(12), 1985, 75

233 Miraclean

Thomas Hill Engineering (Hull) Ltd., Baston Road, 247, Beverly Road, Hull, England HU 52 UV is now manufacturing a single rinse cleaner called Miraclean MB. It consists of two

modules, and both are constructed of stainless steel. The drive module houses the star-wheel feed system and in-feed slat conveyor drive unit, and the treatment module, which is rigidly attached to the drive module, carries the in-feed turnover treatment frame and the discharge turnover unit.

A full length stainless steel tray is situated underneath to collect all residual liquid. Both modules have adjustable leg supports. Star-wheels are protected by a hinged polycarbonate cover, while the turnover and treatment sections are protected by sliding clear polycarbonate covers which are fully safety interlocked. Star-wheels are manufactured from high impact PVC and mounted on stainless steel hubs. Feed and discharge turnovers are precision machined from a solid cylindrical billet of low friction plastics, 450 mm long for glass containers, and mounted in cast iron yokes. This ensures complete rigidity, which is essential for operational efficiency. Fully automatic, the Miraclean MB is quickly and easily installed in an existing or new bottle line. With the infinitely variable speed star-wheel in-feed system being the only moving part, maintenance costs are minimal.
Indian Food Packer 39(2), 1985, 9

234 Multipurpose fruit processor

In the fruit processing industry, the various operations like cutting, pulping, mixing, jelly making and juice extraction are done on separate machines, requiring a multiplicity of capital investment. A low cost, durable and reliable multipurpose fruit processor has now been developed which can perform all these operations at an average rate of 20 tonnes per shift of eight hours.

The versatile fruit processor is the development of Mr. K.X. Benedict, Technical Consultant, KIFCO Products, Panampilly Nagar, P.B. No. 2405, Cochin 682016.

The new fruit processing machine mainly comprises of a base, motor, a housing, a vessel and agitators. The cylindrical vessel made of stainless steel sheet of 14 SWG is 120 cm high and 50 cm in diameter. It has an outlet of 8 cm diameter fitted with a cap. The vessel is bolted on the bracket with 16 stainless steel bolts. The power shaft of the machine fixed in the housing with thrust-cum-bush bearings projects at the bottom of the vessel with a press-pin connecting arrangement, to which three types of agitators-cutter, squeezer and mixer-could be easily fixed.

The agitators are made of stainless steel. The cutter consists of a hub with a number of cutting leaves fixed at 90° to the axis and perfectly ground at 19° to the plane. The squeezer has a number of blades but the edges are round in shape and are fixed on the hub at 21° to the plane. The mixer is like a fan-type impeller: it can exert an average pressure of about 300 gm/cm 2 in fresh water about 30 cm from the rota-

tional imaginary axis.

A special feature of this device is that the power shaft is fixed in a recycling bush bearing lubrication system . In this system the lubricant oil could be filled in a cavity so that, when the power shaft rotates, this lubricant circulates through the bearings providing a very efficient lubrication. Both ends of the bearing housing are perfectly sealed with spring tensioned oil seals to prevent escape of oil. The bottom end of the power shaft is made of the alloy EN-8.

The 5-hp speed control type motor is fixed vertically on the base. The base and the housing bracket are made of mild steel. The motor and the power shaft are connected with three V-grooved pulleys.

How is the processor used ? Suppose you have to cut pineapples into small pieces. First, peel the fruits, and put them in the vessel in sufficient quantity, and then switch on the motor. The pineapple pieces will rush out through the outlet.

If pineapple jelly is required, just accelerate the speed of the motor and decrease the flow rate from the outlet by-the flow controller. If juice or jelly of orange, grape mango or other fruits is to be extracted or pulped without cutting the seeds, replace the cutter by the squeezer and operate as above. When mixed fruit jelly is required, use the mixer after closing the outlet.

The speed of agitators would depend on the nature of the product required. The maximum and minimum speeds are 2,880 and 400 rpm, respectively. The maximum cycling area of the cutter and the squeezer is about 1875 cm^2 The power shaft and the vessel are sealed with a Taflon (PTFF) seal.

The multipurpose fruit processor measures about 120 cm long, 70 cm wide, 190 cm high and weighs 210 kg. It would cost about Rs 55,000. Manufacturing and marketing of the machine is expected to commence shortly.
Invention Intelligence 20(5), 1985, 245-6

235 Twist bottle rinser

A new horizontal type bottle washing plant, called the "Twist bottle rinser", is more compact, economical and efficient than the rotary type rinsers and cleans about 7200 bottles in an hour.

The complete unit has a cylindrical look and is stationary. It consists of three segments-inverter, rinser and reverter. The bottles to be cleaned are pushed in to the inverter segment by an infeed conveyor. The profile is so made that the bottles are automatically tilted upside down during the push. In the rinser segment, the tilted bottles are moved

in a straight line path wherein they are washed/cleaned by a high-pressure multi-jet water spray system. In the reverter segment, the cleaned bottles are tilted once again to the original position and passed on to an out-feed conveyor for further processing.

The whole unit is fabricated either with stainless steel or with mild steel with epoxy paint coating. It requires a floor area of 600 mm x 3000 mm. The complete unit is made for a specific size of bottle only and is not adjustable.

The "Twist bottle rinser" is the development of Epsilon Engineering Works, 28/358, Thadagam Road, Subramaniapuram, Coimbatore-641 040, Tamil Nadu, India.
Invention Intelligence 20(5), 1985, 239

236 Pneumatic conveying system

The Acmevac dilute phase conveying system is used for transporting small to medium quantity of solids over a distance of up to 200 metres. It includes: vacuum, pressure, and vacuum pressure conveying systems. The vacuum conveying system is typically used where flows do not exceed 500 kg/hr; conveyor length is less than 100 metres; and several points are to be supplied from one source. It is suitable for conveying granules-plastic pellets, sugar, grain, catalysts, and fine powders. The pressure conveying system is suitable for free-flowing materials needing a capacity of over 500 kg/hr and conveying distance over 100 metres. It is favoured where one source must supply several receivers, and the material is abrasive in nature. The vacuum pressure conveying system combines the features of both vacuum and pressure systems and is used for unloading bulk material from trucks and transfering it into silos. For further information write to: Acmevac Sales Pvt. Ltd. 109 Unique Industrial Estate, Cardinal Gracious Road, Chakale, Andheri (E), Bombay 400 093.
Industrial Products Finder 14(1), 1985, 35

237 Electronic inspector of packages

An electronic machine vision system, consisting of a camera and computer, inspects and verifies package contents. Unlike human counterparts who are subject to visual fatigue when performing repetitive inspections that result in errors in judgement, the system has constant 20/20 vision.

In addition, human inspectors can focus on only a few contents features as packages move by at high speed, while "In Vision" observes the entire contents. Also, because human inspection is largely subjective, 10 inspectors are likely to make 10 different interpretations of the same part defect.

Developed by Octek Inc., Burlington. MA - "In vision" uses high-speed algorithms to inspect" products. It permits 30,000

packages to be inspected and analyzed while accumulating data on the number, per cent and type of defects. Data also are collected on gray-level transition to allow establishment of accept/reject parameters. Hard-copy statistics may be obtained from printer.

Package contents that do not meet user determined criteria are rejected by downline equipment activated via a communications link with "In Vision".

The system has a non-volatile bubble memory with multiple files. Programs can be written to inspect a number of products with different inspection criteria. All can be run interchangeably on the same product line using a simple 16-function keypad.

Applications include such tasks as sorting of thousands of similar-looking parts, providing visual guidance for manufacturing robots, and inspecting pizza crusts.
Research and Industry 30(2), 1985, 155

238 Fruit packing machine

The Honipack SAP IA is offered for packing spherical fruits (apples, peaches, etc.) is honeycomb profiles and then in layers in boxes. The machine is semi-automatic. The standard Honipack is suitable for all sizes of fruit with diameters between 60 and 85 mm. It has a capacity of more than 50 five-layer boxes (approx 700 kg) per hour, with only one operator. Besides its high capacity, a feature of the Honipack is that it uses continuous honeycomb profile and dividers from the roll. In honeycomb packing each fruit is placed as it were in its own cell. This is achieved because the depth of the honeycomb profile is greater than the maximum fruit diameter and because the machine places a cardboard divider between the individual layers. Pressure on the box is absorbed by the honeycomb, not by the fruit (as e.g. with tray-packing). This minimises the risk of damage to the fruit during transport and storage. For further information write to: Henicel Naderland B.V., Postbus 5, 7020 AA Zelhem, The Netherlands.
Industrial Products Finder 13(10), 1985, 101

239 New solar cooker

A new "Solar Box Cooker" (SBC) developed by two American women as an energy saving cooking method, is now being further refined and promoted in developing countries by a microbiologist at the California State University, Sacramento, with the help of the US Department of Agriculture's Office of International Cooperation and Development (OICD) and USAID's Office of Nutrition.

According to Dr. Fred Barrett, a food. technologist at OICD, the SBC has the double advantage of being able to cook

food and destroy the microbial contaminants in water. Barrett estimates that in most suny countries, one-half to two-thirds of a family's annual fuel cost could be saved with the SBC. Also, it is compact, lightweight, portable, efficient, and inexpensive to make -- the raw materials cost about US $ 20.00, a kit with all the parts, about $ 50.00

In essence, SBCs are insulated boxes with transparent tops that admit and retain the energy of sunlight. When the box is left in direct sunlight, the temperature inside rises to between 120 and 170 degree centigrade within two to three hours, depending on the duration of exposure and intensity of the sun's rays. Once the cooker is in sunlight, food can be placed inside and left for several hours without burning or boiling dry. The cooking time is longer -- what normally takes 45 minutes to one hour to cook in a conventional oven will take about twice as long in an SBC. Foods cooked in an SBC are covered and require no additional water, threfore, no nutrients leach out, even with the longer cooking time.

Food can be cooked and water purified either separately or at the same time, says Barrett. When only water is placed in the cooker on a very bright day, up to three gallons can be purified in four to six hours. Not only is the water made safer, but so are the vessels that hold the water. Thus, the water is likely to remain pure if it is kept in the same vessel after removal from the cooker.

Over 30 different foods common to developing countries have been successfully prepared with the cooker, although some modification of recipes has been necessary to accomodate the longer cooking time. For more information write: Dr. Fred Barrett, C/o Dr. Nicolaas Luykx, Deputy Director, Office of Nutrition, Bureau for Science and Technology, Agency for International Development, Washington, D.C. 20523, USA.
LIFE 18(5), 1985, 1-2

240 Solar dryers for food preservation in Philippines

Food preservation is a serious problem, particularly in the tropics, where fruits and vegetables can spoil quickly. A new method of preserving food, an all weather solar dryer, has been developed by the United States Agency for International Development and the University of Idaho, USA, and has been tested in the Philippines.

The innovative dryer is a cabinet with a supplement heat source coal burned in a clay pot underneath the cabinet. Temperature as well as heat movement and distribution can be controlled and adjusted to environmental conditions. The dryer is also easy to use and inexpensive, as it can be constructed using locally available materials. Philippino extension workers tested the equipment and taught villagers around the country about its operation and design. Fruit and produce were successfully dehydrated and it is estimated that the dryers

will add 20% to an average family income, because food will not perish due to improper storage. Dietary improvements are another important result of the solar dryers, as the fruits and vegetables can provide the needed nutrients.
Current Literature on Science of Science 14(5), 1985, 152-153

241 Tray dryer

Precision Products of Ahmedabad manufacture the Bombay tray dryer for pharmaceuticals, chemicals, dyestuffs, foodstuffs, textile and other products requiring heating and drying process. The tray dryer works on electric/steam as well as electric-cum-steam. Depending upon the properties of the materials to be processed, the heating system is selected. The dryer is made of mild steel frame of double wall construction, lined with mild steel sheets. The cavity formed between the two walls is insulated with fibre glass. Dryers up to 48 trays are provided with one door, while those of 96 and 192 trays have two doors. The Bombay tray dryer is available in five standard models. For further information write to: Jayems Engineering Co. Pvt. Ltd. Great Western Bldg., 1st Floor, 130/132, Apollo Street, Bombay 400 023.
Industrial Products Finder 13(12), 1985, 113

242 Dry laminating machine

Shyam Printing and Laminating Works have developed a dry laminating machine which also calenders and heat-sets flexible woven fabrics, industrial filter fabrics, felts and paper. It requires one hour to set up the machine, which laminates the materials by what is known as the Laminex process. The materials thus laminated are waterproof and have a thermal resistance of up to 170 C. Easily heat-sealed, they are able to withstand humidity, bleaching by sunlight and saline conditions, it is said. The materials find applications as: packing material for tea, pesticides as well as for fabricating bags, book binders, files, satchels, tents, etc. For further information write to: Shyam Printing & Laminating Works, Rosy Tower, II Floor, 8 Nungambakkam Road, Madras 600 034.
Industrial Products Finder 13(12), 1985, 139

243 Homogeniser/disperser

Sonic Corp. of USA have developed an in-line homogeniser/emulsifier/disperser which converts the kinetic energy of high-velocity liquid stream into high intensity mixing energy. The conversion of energy within the liquid stream is accomplished by utilising a physical phenomenon known as a "jet-edged tone". For further information write to: Dr. B.H. Chalishezar and Associates, 5 Fifth Floor, K.B. Commercial Centre, Ahmedabad, Gujarat 380 001.
Industrial Products Finder 13(10), 1985, 79

244 Mixer homogeniser

Moritz Chemical Engineering Ltd., Felstead Road, Epsom Surrey, England has developed a high speed, in-line mixer homogeniser. It is called Relentless, and is supplied in two versions with capacities of up to 59000 litres/h or 18000 litres/h. Products can be sheared down to near micrometre size, and the homogeniser is intended for in-line continuous mixing of dissimilar products where particle size reduction is required. It is also suitable for mixing in oils and emulsifying a solution.

The bore of the inlet and outlet connections is 75 mm for the larger unit and 50 mm for the smaller. Materials can be gravity fed into the mixing chamber. Rotors are 150 and 100mm in diameter respectively for the two sizes of machine, and operate at 3000 rev/min. They are attached directly to the extended motor shaft and sealed against leakage by a mechanical seal. The design of the unit ensures that all of the solution passes through the working parts of chamber. The two sections of the mixing chamber are secured together by eight stainless steel bolts and are easily separated for inspection and maintenance.
Indian Food Packer 39(2), 1985, 8-9

245 Colloid mill/homogeniser

The Capitol colloid mill features a flow principle that causes the flow countercurrent to centrifugal force. This subjects the product to longer periods of shear force in the working area, and results in superior emulsion and dispersion, it is said. The completely closed design prevents the incorporation of air into the product and product foaming. With removal of one nut, all parts in contact with the product can be removed from the mill body for fast cleaning and maintenance. Applications of the homogeniser are in foodstuffs-mayonnaise and salad cream, fish paste, citrus oil emulsion, reconstituted cream and emulsion of oil and fats for bread and cake making, chocolate, tomato and other soups; and other industries. For further information write to: Capitol Engineering Works, Plot No. C-30, Road 16, Wagle Industrial Estate, Thane, Maharashtra 400 604.
Industrial Products Finder 14(1), 1985, 93

PACKAGING

246 Future of plastic containers for food

The use of plastic containers will increase six-fold by the year 2000, according to a study commissioned by DuPont Co.

Major growth will be in the use of barrier resins in rigid and semirigid composite containers. By 1991, plastics will have more than doubled their share of the total U.S market for rigid and semirigid containers since 1981. The earliest use for these containers will probably be for high-acid foods, such as fruits and vegetables, catsup, and other sauces, but during the 1990s, manufacturers of low-acid foods and beer will also shift to plastics. Furthermore, by 1991, extrudable resins will have 90% of the flexible barrier market, compared to approximately 25% in 1981. The solvent and emulsion-coated barriers that now constitute a large percentage of the market will be repalced, due to lower costs and versatility resulting from improved film-coextrusion and coextrusion-coating techniques. Leading candidates for high barrier resins are ethylene vinyl alcohol, polyvinylidene chloride, and polyvinyl alcohol.
Cereal Foods World 30(7), 1985, 479

247 Caps for ketchup bottles

India Ink Corporation manufacture plastic caps for ketchup bottles. The caps are made from food grade HDPE and colouring pigments. the moulding is done on automatic machines. For further information write to: India Ink Corporation, Plastic Division, 11/7 Mathura Road, Faridabad, Haryana.
Industrial Products Finder 13(Annual No.), 1984, 101

ANALYSIS

248 Detection of palas oil in groundndut oil

The Central Agmark Laboratory, Nagpur, has developed a rapid and reliable method to detect palas oil, used as an adulterant, in groundnut and other edible oils.

The method, which can detect as low as 3% of palas oil, involves the isolation of unusual components either along with the unsaponifiable matter (USM) or by treating the oil sample with suitable amount of hydrochloric acid. The extract is dried and dissolved in acidified chloroform, spotted on TLC plates, and resolved using a suitable solvent system. The chromatogram is viewed under UV light, when a number of green/blue fluorescent spots appear indicating the presence of this oil in groundnut oil or other edible oils.

It is based on extraction of alkaloids found in the unsaponifiable matters of palas oil and later the alkaloids are treated with hydrochloric acid and resolved chromatographically and viewed under ultra violet light to study the characteristics of fluorescent spots.

Palas oil is obtained from seed kernels of palas, also

known as 'flame of the forest' (Butea monosperma). Its kernels contain 17-20% of yellow, tasteless oil (sap. value 175-190, iodine value 65-85). Some of the physiochemical characteristics of palas oil are similar to those of groundnut oil (especially the higher fatty acids like arachidic, behenic and lignoceric acids, which are present to the extent of 12-15 %). The edibility of this oil is also doubtful due to toxicological point of view.
PTI Science Service 4(15), 1985, 18

249 Detection of E.coli

Direct fluorogenic detection of **E.coli** in food ingredients may be accomplished by incorporation of 4-methylumbelliferyl-β-D-glucuronide in MacConkey agar or lauryl sulfate broth. For more information, contact Marcor Development Corp., 206 Park St., Hackensack, NJ 06701.
Food Technology 39(9), 1985, 106

250 New way to measure emulsifier levels

Emulsifiers, which are widely used in all types of foodstuffs at levels around 0.5 per cent, have up to now been very difficult to determine, but scientists at the Leatherhead Food RA in England have developed a novel method for dealing with the problem.

By studying the chemistry of compounds and their reactions with metal salts, they produced a totally new method for the determination of certain emulsifiers.

The new method is very simple and can be carried out in a single test tube in a few minutes. Tests on food products have shown that the method is reproducible and accurate, with a detection level around 0.1 per cent. By using a range of reagents the class of the emulsifier can be identified.

For emulsifiers which do not react with inorganic salts a second novel method was devised, which involves converting the emulsifier into an anionic detergent, which is then amenable to colorimetric analysis.

Both these methods are now widely used in quality control laboratories to check the level of emulsifiers. They are easily carried out by quality control staff and require no special equipment.

Further information is available from The British Food Manufacturing Industries Research Association, Randalls Road, Leatherland, England.
Food Technology in New Zealand 20(3), 1985, 5

251 Sodium and potasium estimation

Sodium and Potasium may be analyzed directly in an aqueous extract by a Flame Photometer coupled with a Auto Analyzer II continuous-flow system. After sample preparation, analysis rates of up to 80/hr may be achieved. This method is oriented towards helping food manufacturers and processors to fulfil mandatory FDA nutritional labeling requirements. Further information on this method may be obtained from: Wet Chemistry Systems, Technicon Instruments Corp., Industrial Systems Div., 511 Benedict Ave., Tarrytown, NY10591.
Food Technology 39(9), 1985, 105

252 Fast water activity measurement

Selby Scientific advise of the availability of the Novasina Thermoconstanter which provides fast and accurate (a_w) (water activity) measurements in a wide variety of materials including foods, chemicals, drugs and pigments under accurately defined temperature conditions. The measuring chamber is a miniature heater/refrigerator in which the temperature can be digitally preselected within a range from 0 to 50 C with maximum control deviation of less than 0.1 C. Short measuring times are achieved by positive-action heat input to, or heat extraction from the measuring chamber.

A built-in Novasina transmitter provides humidity measurements in a range from 0.1 to 1.0 a_w or 10 to 100% RH, with a measuring accuracy of +1% % RH.
Food Technology in Australia 37(3), 1985, 102

253 Automatic bacteria counter

Automatic counting of bacterial colonies may be accomplished by using the AutoCount automatic counter. This instrument has an adjustable aperture which allows operators to isolate an object or group of objects for separate image counting. Adjusting the size discriminator dial eliminates objects that are smaller than the determined size threshold. The autocount may also be manually adjusted to a proper sensitivity threshold. Each scanned object is flagged with an illuminated dot so the operator can see exactly which objects have been included in the count. For more details, contact Artek Systems Corp. Farmingdale, NY 11735.
Food Technology 39(9), 1985, 106

254 Moisture meter

Moisture content of whole grains, oilseeds, flours, pastes, powders, liquids, and many other materials may be measured without grinding or other sample preparation using a near-IR moisture meter. Called TREBOR-30A, this meter uses a

light transmittance technique which is based on the change in infrared spectra of light passing through the sample. Answers, displayed directly in percent moisture from 0.1% to 99% on the instrument's readout within 25 sec of sample introduction, are accurate to 0.2% and repeatable to 0.1%. Since the sample needs no grinding or heating, results are not influenced by variations in preparation or by water boil-out. For additional information, write to Trebor Industries, Inc., 7826 Airpark Rd., P.O. Box 2159, Gaithersburg, MD 20876.
Food Technology 39(9), 1985, 105

255 Copra meter

The Central Plantations Crops Research Institute, Kasragod, has designed and developed an electronic moisture meter for determining the moisture content of dried copras.The new electronic moisture meter, costing around Rs.350, works on the principle of electrical conductivity and has been calibrated against standard air oven method. The battery operated device has two probes to be inserted into the coconut kernel and the percentage of moisture content is indicated directly on the meter.

Precise information on the moisture level in the copra is crucial for extracting good quality oil as also for ensuring safe storage. Experience has shown that copras with less than six per cent moisture yield the best quality oil. Those having over 10 per cent moisture are prone to damage during storage due to mould development and pest attack.
PTI Science Service 4(21), 1985, 3

COMMERCIAL INTELLIGENCE

256 All India final estimate of coriander and garlic for 1983-84:

State	Coriander		Garlic	
	Area (Hectares)	Prodn. (Tonnes)	Area (Hectares)	Prodn. (Tonnes)
Andhra Pradesh	1,58,800	66,900	928	1,585
Bihar	4,200	3,188	2,596	2,365
Gujarat	–	–	25,500	1,06,000
Haryana	212	101	467	8,230
Jammu & Kashmir	–	–	100	Neg.
Karnataka	16,233	1,959	2,738	2,716
Madhya Pradesh	44,981	11,440	17,813	64,447
Maharashtra	–	–	4,400	31,500
Nagaland	–	–	160	120
Orissa	15,181	7,787	17,744	65,951
Punjab	–	–	214	1,351
Rajasthan	1,13,114	56,414	5,820	3,991
Tamil Nadu	49,900	19,500	490	2,720
Uttar Pradesh	5,443	3,293	3,743	13,568
	4,08,064	1,70,582	79,713	3,04,544

Agricultural Situation in India, May 1985, 143-148

PRODUCTION (INDUSTRIAL)

257 Sugar Production

According to the Indian Sugar Mills Association, the sugar production during the first fortnight of October 1985 (i.e. 1.10.85 to 15.10.85) of the season 1985-86 was about 14,000 tonnes as against 7,000 tonnes during the corresponding period last season.

The total closing stock of sugar as on 15th October, 1985 was about 14,15,000 tonnes (including 1,62,000 tonnes imported sugar) as against about 21,07,000 tonnes (including 1,08,000 tonnes of the imported sugar) on the same date last season.
Indian Sugar Mills Association press release, 8 Nov 1985.

EXPORT

258 Indian export of frozen meat to Mauritius

The consumption of beef in Mauritius is about 3000 tons (excluding offal). Till last year Mauritius has been importing meat from Madagascar but the internal conditions in Madagascar have deteriorated to such an extent that the livestock managers in Madagascar are no longer able to supply meat to Mauritius. Mauritius then resorted to importing meat from Australia. The Indian High Commission in Mauritius has taken up the question of export of frozen beef and buffalo meat from India and arranged two Mauritian veterinary experts to visit butcheries in New Delhi and Bombay. The Government of Mauritius have finally approved five meat exporting firms from India. Several consignments of frozen beef each of 30 to 40 tons have thus far been brought into Mauritius from India commencing from July 1984. It is confirmed that the Indian frozen meat is nearly 20% cheaper than the Australian meat available in the market. As a result of this the consumption of frozen beef in Mauritius is likely to further pick up. Thus, the export of frozen meat from India is expected gradually and steadily to pick up to about 100 to 150 tons per month, provided Shipping Corporation of India continues to have regular sailing and continue to offer reefer cargo space in all the sailings. In due course frozen meat markets in Comores island and Seychelles could also be captured by India.
India Export Newsletter 8(5), 1985, 34-5

259 Major markets for Indian Marine Products

During the year 1984, Indian marine products sailed to as many as 36 countries as against 34 countries in 1983 and 27 in 1982. About 33 items were exported including two new items viz. dried squid and salted jelly fish. Since 1971 Japan has been the leading importer of Indian marine products and in 1984 also Japan maintained the lead. Of the total exports of 89912 tonnes valued Rs. 385.50 crores, Japan accounted for 42119 tonnes (46.8%) in volume and Rs. 263.76 crores (68.4%) in value. U.S.A., the second largest market accounted for 12142 tonnes valued Rs. 47.88 crores, thus accounting 14% in terms of quantity and 12.42% in terms of value. U.K. continued to remain as the third largest market (Rs. 22.28 crores) while Sri Lanka occupied the fourth position (Rs. 7.82 crores) and Singapore the fifth position (5.41 crores). Other major markets for Indian marine products exports during 1984 were UAE (Rs. 5.10 crores), Taiwan (Rs. 4.73 crores), Netherlands (Rs. 4.45 crores), Belgium (Rs. 4.35 crores), Kuwait (Rs. 4.24 crores), France (Rs. 4 crores) etc.
Seafood Export Journal 17(6), 1985 23, 25

260 Froglegs export

The Government has banned the severing of the hind legs of live frogs for export processing.

Exporting licences for frozen froglegs will now be issued only to those who kill the amphibians by the painless electrical stunning method developed by scientists of the College of Fisheries, Mangalore (see item No: 226 of this issue).

Froglegs, a big foreign exchange earner, are considered a delicacy in South-West Asia, West Europe and the U.S.
Financial Express 11 Oct. 1985, 1

261 Rules Relaxed for Release of Foreign Exchange

The Reserve Bank of India has liberalised the rules relating to the release of foreign exchange for placement of advertisement in foreign newspapers and magazines, which may help to promote export from India.

Remittance towards the cost of advertisements by Established Exporters can now be allowed upto 5 per cent of their export earnings during preceding year subject to a maximum of Rs. 5 lakh. However, in case of Established Exporters not only should their Banker's report be favourable but their export performance should also be satisfactory in the three preceding years, according to a notification issued by the Reserve Bank of India. The notification adds that their export outstandings should not exceed 10 per cent of the export realisation during the preceding year. In the case of New Entrants in the export

field with little or no past export earnings to their credit, remittances for advertisements would be allowed upto Rs. 2 lakh.

Reserve Bank of India has also raised the foreign exchange expenditure relating to legal expenses in respect of dishonoured export bills. Thus, remittances towards legal expenses can now amount to 25 percent of the value of the export bill or bills in question or $ 10,000/- whichever is less. These remittances can also be allowed for meeting expenses abroad for settling other types of legal disputes connected with exports which do not necessarily relate to dishonouring the export bills.

In the case of legal expenses connected with non-export transactions, remittances would now be permitted upto $ 10,000/- or its equivalent in the aggregate for any single case.

The limits for remittances abroad for certain other specific purpose have also been raised. Revised limit for arbitration fee is $ 200; correspondence course fee $ 300; examination fee $ 300; export information fee $ 200; membership fee for scientific and technical institution $ 300 per person; patent trade mark fee $ 1000; publication charges $ 200; and purchase of copyright material and new pictures $ 100.

India Export Newsletter 8(5), 1985, 35-6

TRADE INFORMATION

262 India to import fresh fruits from Afghanistan

India and Afghanistan have concluded a deal under which India will import fresh fruits from Afghanistan against export of non-traditional goods.

Under the Memorandum of Understanding signed recently, the National Agricultural Cooperative Marketing Federation (NAFED) will import fresh fruits from the Afghan Vegetable and Fruit Export Enterprises Limited on C and F basis for the current season, to the tune of Rs. 5.5 crores. Ninety per cent of the value of fresh fruit, contracted for will be credited into a special convertible dollar interest-bearing account in the State Bank of India, London in the name of Afghanistan Bank. The blocked account will be used exclusively to finance tea.

The export of non-traditional items from India will be undertaken by public sector undertakings like the State Trading Corporation and Projects Equipment Corporation. The items identified for exports include drugs and pharmaceuticals, hospital equipment, tyres and tubes, poultry items, cosmetics, toiletry and detergents, insecticides and pesticides, textile

items, including rayon fibre, consumer durables including bicycles, sewing machines, diesel engines, pumpsets, sanitary goods and bathroom fittings, leather and leather goods, spices and cigarettes.
The Hindu 28 October 1985, 13

263 India going in for Polish knowhow for food processing

India is going in for sophisticated Polish food processing technology on a massive scale.

Poland has clinched major deals for the supply of the entire flour mills equipment in the face of tough competition from the UK, West Germany, Czechoslovakia, and the Soviet Union.

According to a Polish official, Mr. Krzysztof Tzpilewski, Poland has already supplied this year 100 tonnes per-day capacity flour mills plants worth $ 200,000 each to two Indian companies, Jammu Flour Mills and Simla Roller Flour Mills.

Mr. Tzpilewski told UNIFIN that orders have been contracted for supply next year of two more flour mills each of 60 tonnes per-day capacity, to Chinar Flour Mills based in Srinagar and SS Roller Flour Mills in Kapoli, Maharashtra. Each mill costs about $ 150,000. Another area where Indian companies have shown interest in Polish technology is potato-based breweries and distilleries. Mr. Tzpilewski said negotiations were on with Picup of Uttar Pradesh for a potato-based distillery. A joint venture may be on the cards, he said.
Financial Express 25 November 1985, 3

264 Indo-Italian Co-operation in fruit cultivation

The Government have entered into an agreement with the Government of Italy for a scheme for development of temperate climate fruits in the country, according to a recent announcement of the Minister of State for Rural Development, Mr. Chandulal Chandrakar. The Italian assistance would be in the form of agricultural machinery, implements and tools, irrigation equipment, vehicles, planting material, fertiliser, chemicals and training to Indian personnel. The total estimated Italian assistance under the project would be about 4,327.6 million Lira, the Minister added. The project is being implemented in select areas in Himachal Pradesh, Jammu and Kashmir and Uttar Pradesh. Some of the important fruits to be developed are olive, almonds, walnuts and hazel nuts.
Economic and Commercial News 15(35), 1985, 5

265 Imitation cheese

Consumption of imitation cheese is increasing, according to estimates by the United Dairy Industries Association, which

sees imitation cheese taking over as much as 5% of the U.S. market. The most popular items are imitations of cheddar, American, and mozzarella cheeses. Most of these are going into processed foods, with frozen pizza being a major outlet. In these cases, the manufacturer need not always state on the label that imitation cheese is being used in the food item, according to FDA labeling regulations issued more than a year ago.
Cereal Foods World 30(6), 1985, 415

266 Packaging of foods and allied products

A list of British packaging firms interested in collaboration arrangements with Indian firms engaged in packaging of food and allied products, has been obtained by the Indian Investment Centre, 263, Regent Street, London W-1 from the British Overseases Trade Department. Those interested in having more information in the matter may please get in touch with the Indian Investment Centre at the following address: Mrs. S.D. Barwa, Indian Investment Centre, 263, Regent Street, London-W-1.
India Export Newsletter 8(5), 1985, 35

FOOD REGULATION, QUALITY CONTROL AND HYGIENE

FOOD REGULATION

267 Salt labeling

Mandatory salt labeling regulations become effective July 1, for all processed foods with nutritional labeling regulated by the Food and Drug Administration. According to the FDA, approximately 55% of the regulated foods were in that category in 1983, increasing to approximately 60% in 1984. A company is required to put nutritional labeling on its products if it adds nutrients during processing or if it makes any nutritional claims for the products. The change in status is not expected to cause any major problems, in that most manufacturers have already voluntarily complied with the regulation.
Cereal Foods World 30(6), 1985, 415

268 Compulsory certification for vanaspati

Vanaspati will be brought under mandatory certification with effect from 1, October 1985 for which notification has already been issued by the Government of India. This was announced by the Union Minister of Food and Civil Supplies Rao Birendra Singh at the 41st Meeting of General . Council of the Indian Standards Institution (ISI), held in New Delhi recently.

He said that the Government laid great deal of emphasis on quality control and was determined to enforce quality control for various products.
Economic and Commercial News 15(35), 1985, 11-12

269 Permits gamma irradiation of pork

The Food and Drug Administration is permitting gamma irradiation of pork at up to 1 kGy (100 krad) to control Trichinella spiralis, as petitioned by Radiation Technology, Inc., Rockaway, N.J. Details are in the Federal Register of July 22. For more information, contact C.A. Takeguchi at FDA, 200 C St., S.W., Washington DC 20204.
Food Technology 39(9), 1985, 29

270 Permits tocopherol in pump-cured bacon

USDA's Food Safety and Inspection Service is permitting the use of d-and dl-alpha-tocopherol as an inhibitor of N-nitrosamine formation in pump-cured bacon, as petitioned by Hoffmann-La Roche, Inc., Nutley, N.J., and Diamond Crystal Salt Co., St. Clair, Mich. FSIS is also permitting the use of lecithin as an emulsifier in meat food products, as petitioned by Central Soya co., Ft. Wayne, Ind. Details are in the Federal Register of July 5 and 12. For more information contact D Jones at USDA/FSIS, Washington, DC 20250.
Food Technology 39(9), 1985, 29

HYGIENE

271 Bacteria against odour pollution

The French firm, S.A.P.S. at Valdampierre has developed a biological deodourization process (Gerfo-Martin process) for overcoming odour pollution, e.g. those resulting from processing of animal raw materials. The process is based on the premise that many odoriferous components (amines, mereaptans, aldehydes, etc.) are bio-degradable, i.e. to say can be transformed by micro-organisms.

The process involves the immobilisation of the malodorous molecules by adsorption - on a peat bed, for example; thereby, there is produced on the bed, a biological equilibrium which is required for the development of a bacterial flora that, in its turn, will ensure the self-purification of the adsorption bed. The bacteria, bred in situ, convert the odorous compounds into carbon dioxide and water.

The peat bed is continuously regenerated by addition of oxygen, nitrogen, carbon, or phosphates. The gas is first led into a washer (or scrubber) for pre-cleaning, before it comes into contact with the micro-organisms in the preparation pit on

the aerated peat-bed. Water is passed over the bottom of the pit, and is then led, along with other effluents to a clarifying installation, or is re-injectd into the peat-bed to clean the latter. This process is particularly suitable for adoption in the food industry also.
Gordian 85(5), 1985, 95

272 Pesticide residues in milk

A study conducted by the Tamil Nadu Agricultural University, Coimbatore, has found residues of the widely used pesticide, BHC (benzene hexachloride), in an overriding proportion of breast milk and cow's milk samples taken in and around Coimbatore - another evidence of this much abused pesticide having permeated right through the food chain.

About 70 per cent of the breast milk samples were contaminatd with BHC, and heptachlor residues were detected in 29 per cent of the samples.

Of the 100 samples of cow's milk tested in the study conducted in August, more than 95 had BHC residues in excess of the tolerance limit (0.3 parts per million on fat basis).

DDT, another widely used pesticide, was much less in evidence. Its residues were noticed in 60 samples of cow's milk, but only seven per cent of them had residues in excess of the safe limit of 1.25 parts per million.
The Hindu 8 October 1985, 1

273 Iron from cooking utensils

Some new research indicates that cooking in iron skillets and pots can add significant amounts of iron to the food. Dr. Helen C. Brittin, Professor of Food and Nutrition at Texas Tech University does not yet know precisely how much iron is transferred to specific foods when they are cooked in iron utensils, but she hopes to find out.

Dr. Brittin tested 20 foods and found that, on the average, they contained twice as much iron when cooked in iron skillets as those prepared in utensils made of other materials. But, she also discovered that not all foods increase in iron by the same amount. The iron uptake appears to be enhanced when the foods have a high acid content, a high moisture content, and are cooked for extended periods of time.
Life 18(5), 1985, 5

TRANSFER OF TECHNOLOGY AND NEW INDUSTRIES

274 Conservation of energy

The National Productivity Council (NPC) has undertaken a nation-wide project to conduct energy audit in the industrial sector with a view to conserving the much-needed energy and stepping up its availability for economic growth of the country. According to the project, taken up as part of the Energy Management Programme of the Council, possible areas of energy saving in the industries will be identified and various conservation techniques managerial as well as technological, devised for adoption by the industry.

The industrial sector has been selected for detailed energy audit because of its high consumption and saving potential of energy. Industry accounts for a major portion of the energy consumption which is expected to rise still further. At present, the share of the industrial sector in the consumption of commercial source of energy is nearly 40 per cent and conservation steps can reduce the consumption levels to an appreciable extent.

The NPC had earlier conducted energy audit in nearly 200 industrial units, covering 12 sectors of the industry. The studies revealed a potential saving of energy of nearly 25 per cent of the total energy consumed in the industrial sector, leading to a recurring annual saving of over Rs. 19,250 million. The total investment for creating equivalent energy capacity would be over Rs. 57,000 million. Added to these savings are the resultant benefits like reduced load and transport capacity and reduced pollution levels, due to less consumption levels and also less consumption of energy.

A detailed and in-depth energy audit is now under taken by NPC in the industrial sector for devising energy conservation techniques. As a first step, major industrial sectors and industrial units to be covered under the audit are being identified. The audit studies are expected to be taken up in two stages, preliminary audit and diagnostic audit. Under the preliminary audit, three steps are visualised. The first step will be to identify the quantity and cost of various energy forms used by a plant. The second will be to identify energy consumption at various levels. the last step is to relate energy input and production output, thereby highlighting wastages in major equipment and processes.

The diagnostic energy audit will include a technical energy analysis of individual companies, groups of components and process. The amount of energy expended in certain machines and process will be identified, and managerial and technologi-

cal devices to conserve energy will be evolved. A detailed plan of action on the basis of this study will also be formulated. The project also envisages development of energy consumption norms and models and establishment of a reliable and permanent energy information system for disseminating the relevant information about energy conservation. The establishment of the Information Cell would also help other organisations engaged in implementation of Energy Conservation Programmes.
Economic and Commercial News 15(30), 1985, 9-10

NEW INDUSTRIES

275 Brenntag's guar gum is tasteless and odourless

Brenntag (UK) Ltd of Brenntag House, 45 High Street, Hampton Wick, Kingston-upon-Thames, Surrey KTI 4DG, has introduced grades of guar gum for the food industry. Principal advantages claimed for this new line, distributed in the UK under a sole agreement with Dabur of India, are freedom from odour and taste, and guarantee of viscosity value from the producer. Three standard particle sizes are available - 175, 200 and 250 mesh.

Apparently, the grades of gum described above are products of the first modern production unit to be built in India using Western European technology. The special thermo mechanical process used and the speed with which the guar plant is processed, after harvesting, ensures both the quality of the product and its freedom from taste and odour. In the latter respect guar gum can be offered as a replacement for locust bean gum for the first time, they tell us.
Food Trade Review 55(6), 1985, 292

276 New plants to process fruit and vegetable products

Over 6250 tonnes of tomatoes, 1520 tonnes of mangoes, and 530 tonnes of pineapples will be processed annually by the Agro-Industrial project at Hajipur in Vaishali district of Bihar. The project being implemented by the Bihar Fruit and Vegetable Development Corporation Ltd., jointly set up by the Union and State Governments, aims at integrating production, processing and marketing of fruits and vegetables. The Union Government has already contributed its equity share of Rs. 49 lakh to the project which involves a capital outlay of Rs. 194 lakh. The project is expected to be completed and commissioned during the current year.

The public sector Modern Food Industries (India) Ltd, (MFIL) is setting up a pineapple juice concentrate plant at Silchar (Assam) with a capital cost of Rs. 207 lakh. The plant would process 4860 tonnes of pineapples annually. The MFIL is

also setting up a fruit processing plant at Bhagalpur (Bihar) with a capital cost of Rs. 119 lakh. the plant would process 3,360 tonnes of mangoes, 1,680 tonnes of guavas and 1,440 tonnes of pineapples per annum. the Bhagalpur Plant is expected to be ready by the middle of the current year and the Silchar plant by early next year.

Besides, the North Eastern Regional Agricultural Marketing Corporation (NERAMAC) is also setting up a pineapple and orange juice concentrate plant at Kamarghat (Tripura) at an estimated capital cost of Rs. 213.56 lakh. The plant would have a capacity of processing about 6,800 tonnes of pineapples and oranges annually.

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PERSONALIA

Nil.

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